

NOT JUST AN INFANTRYMAN'S WAR: UNITED STATES
ARMORED CAVALRY OF THE VIETNAM WAR

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ABSTRACT

NOT JUST AN INFANTRYMAN'S WAR: UNITED STATES ARMORED CAVALRY OF THE VIETNAM WAR, by Major Brian D. Kerns, 120 pages.

This is a study of the organization and equipment of the United States Army armored cavalry squadrons which fought in the Vietnam War. It begins with a background on the buildup of armored forces in Vietnam and a summary of the terrain and enemy. Next, the doctrinal missions of the armored cavalry is compared against the actual missions armored cavalry executed in Vietnam. This study then describes the equipment and organization used by armored cavalry squadrons and modifications made in order to adapt the armored cavalry squadron to fight on a nonlinear, restrictive terrain battlefield against an asymmetric threat.

This study concludes that the inherent combined arms task organization of armored cavalry squadrons made them an extremely successful force during the Vietnam War. The most capable of the various armored cavalry squadron organizations was the regimental armored cavalry squadron following the fielding of the M551 Sheridan in 1969. The regimental armored cavalry squadron with Sheridan was effective because it achieved the most effective balance of mobility, firepower, protection, and shock effect.

This study attempts to provide some insight how to effectively organize and equip armored cavalry forces to fight on a nonlinear battlefield against an asymmetric enemy.

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ACRONYMS

ACAV	Armored Cavalry Assault Vehicle
ACR	Armored Cavalry Regiment
AO	Area of Operations
APC	Armored Personnel Carrier
ARVN	Army of the Republic of Vietnam
COSN	Central Office of South Vietnam
CTZ	Corps Tactical Zone
FA	Field Artillery
FM	Field Manual
FMC	Food Machine Corporation
FFV	Field Force Vietnam
GSR	Ground Surveillance Radar
HE	High Explosive
HEAT	High Explosive Antitank
HHT	Headquarters and Headquarter Troop
LOC	Lines of Communication
NVA	North Vietnamese Army
NLF	National Liberation Front
MACV	Military Assistance Command, Vietnam
MACOV	<i>Evaluation of Mechanized and Armor Operations in Vietnam</i>
MTO&E	Modified Table of Organization and Equipment
PAVN	Peoples Army of Vietnam
RPG	Rocket Propelled Grenade

RVN	Republic of Vietnam
TO&E	Table of Organization and Equipment
VC	Viet Cong

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CHAPTER 1

INTRODUCTION

When someone conjures up the image of cavalry throughout history, they typically envision an audacious horse-mounted trooper at the decisive point on the battlefield. The classical cavalry trooper's rapid and bold action was critical to the success or failure of a battle or campaign. These images are in stark contrast to the average cavalry trooper's experiences during the Vietnam War. The US cavalry trooper in Vietnam plodded through the jungles, wetlands, and highlands to gain and maintain contact with the enemy. Occasionally, a cavalry trooper engaged and destroyed his enemy; often his enemy would slip back into the jungle. Despite the restrictive terrain and elusive nature of the enemy in Vietnam, the armored cavalry units in Vietnam retained their core competencies of speed, flexibility, and firepower to remain a relevant force and achieve tactical success on the battlefield.

Historically, cavalry was a combat arms element characterized by mobility, firepower, and shock action. Cavalry's mobility and ability to operate independently from the main body gave the cavalry an advantage over the infantry. The Europeans developed highly specialized mounted units such as heavy cavalry used for shock effect at a decisive point, light cavalry used for long-range reconnaissance and security operations, and dragoons, cavalry that could function as infantry for economy of force missions. Other key roles for European cavalry included countering enemy cavalry and infantry attacks, covering retreating friendly forces, and pursuing a retreating enemy ¹

The United States developed its early cavalry units based on the European light cavalry.² As a result, US cavalry doctrine historically focused on two major roles, reconnaissance and security operations. The third historic role of the US cavalry has been the economy of force mission. An economy of force mission occurred when the maneuver commander utilized his cavalry to defend or attack over a large area against a numerically superior enemy in order to conserve combat power enabling the main body to mass forces elsewhere.

US cavalry has been adaptive throughout its history and was not confined to its three primary roles of reconnaissance, security, and economy of force. In the early 1800s, the US Army developed cavalry units to conduct counter-guerrilla operations against the Indians on the western frontier.³ Later, US cavalry units conducted constabulary operations following World War I. More recently, cavalry squadrons conducted stability and support operations in Haiti and Bosnia during the 1990s. All of these missions were outside the traditional cavalry roles used in Europe.

New technology has resulted in steady changes to the cavalry's organization and equipment. The last horse mounted cavalry unit in the US Army saw action in the early stages of World War II. The US Cavalry began to replace the horse with motorized vehicles, armored cars, mechanized vehicles and tanks prior to World War II. To facilitate the transition to armor and mechanized equipment the cavalry branch, which resisted the replacement of horses, was dissolved. The Armor Branch replaced the cavalry as a permanent branch in 1950 and became the proponent for cavalry operations.⁴ In the early 1960s, armor officers enthusiastically accepted the newest technology, the helicopter, as a cavalry platform.

Ever since mechanized vehicles were introduced to warfare, the US Army has struggled with the question of how should cavalry be organized and equipped? The modern US cavalry often adapted equipment developed for the armor and infantry branches, because the procurement of a cavalry armored vehicles was not a priority for the US Army. Another issue of organizing and equipping the cavalry was the need to balance firepower, protection, mobility, and stealth. Light cavalry units were highly mobile and stealthy, but lacked firepower and protection. The problem of equipping and organizing the modern cavalry was further complicated by the multitude of missions placed upon the cavalry, the wide range geographic areas they operated in, and a constantly changing threat. Regardless of the threat, terrain, or mission, cavalry units must retain the characteristics of armor, firepower, mobility, shock action, extensive communications, and flexibility.

The issue of equipping and organizing the cavalry remained a dilemma for the US Army during the Vietnam War. Prior to the Vietnam War, cavalry doctrine focused on reconnaissance and security missions. Although not specifically mentioned in US cavalry doctrine, the Army designed the cavalry organizations to counter a Soviet threat on the European battlefield. The terrain and threat in Vietnam was nothing like the terrain or threat in Europe, and thus required a different role for the armored cavalry.

For this thesis, it is important to define some key terms (a glossary is provided at the end of the thesis). Armor is normally used to refer to tanks and other armor-protected vehicles. Armor can also refer to units associated with armored vehicles that fell under the US Armor Branch for doctrine development, training, and research. Armored cavalry and tank units fall under the purview of the US Armor Branch. Therefore, referring to

armor units implies both tank and cavalry units. Armored cavalry denotes cavalry units whose primary combat systems were tracked and had armor protection. The term mechanized infantry refers to infantry units that utilize lightly-armored tracked vehicles to move and support infantry soldiers on the battlefield. Although tank and mechanized infantry units in Vietnam had different doctrinal missions than cavalry units, they employed similar equipment and tactics in Vietnam. Typically, armor and mechanized units fought as combined arms teams, therefore any analysis of armored cavalry in Vietnam should consider armor and mechanized operations.

Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms*, defines an operational environment as “a composite of the conditions, circumstances, and influences that affect the employment of military forces and bear on the decisions of the unit commander.”⁵ The contemporary operational environment is the overall operational environment that exists today and in the near future. Two characteristics that exemplify the contemporary operational environment are asymmetric threats and a nonlinear battlefield. An asymmetric enemy uses unanticipated or nontraditional approaches to circumvent or undermine an adversary’s strengths while exploiting his vulnerabilities through innovative means.⁶ A nonlinear battlefield is defined by its lack of structure where the close, deep, and rear operations may have no adjacent relationship. On a nonlinear battlefield, close operations can take place throughout the entire area of military operations, rather than just at the forward area as in the linear organization.

Although the many current military professionals often talk as if asymmetric and nonlinear warfare are new concepts, only the terms are new and not the concepts. The

term most often used in the 1960s and 70s to describe the warfare in Vietnam was Area Warfare. Area Warfare resulted when armed forces seeking to achieve control of the population of a country were unable, or unwilling to conduct warfare in the traditional sense.⁷ Today the US Army would define the warfare in Vietnam as nonlinear against an asymmetric enemy. The terms are different, but the concepts are the same.

The primary questions this thesis will answer is: What was the most effective armored cavalry squadron table of organization and equipment used during the Vietnam War and why was it effective? The doctrinal characteristics of cavalry found in Field Manual 17-3, *Armored Cavalry Platoon, Troop, and Squadron*; and Field Manual 17-95, *Armored Cavalry Regiment*, consisting of: armor protection, firepower, mobility, shock action, and flexibility, will be used as the criteria to evaluate the effectiveness of cavalry squadrons. The other measure of effectiveness is how well-equipped cavalry squadrons were to execute their modified missions and roles. In addition to the primary question using the established criteria, several secondary questions must be answered.

1. What were the missions and roles for the armored cavalry squadron in Vietnam and how do these missions differ from traditional cavalry missions during this time period?

2. How effective were cavalry squadrons at performing these missions?

3. How were the US Army's cavalry squadrons organized and equipped during the Vietnam Conflict?

4. What were the advantages or disadvantages of the various organizations and equipment?

5. How did the cavalry organization of the US allies influence the cavalry organization of the US Army?

6. How did the type and availability of equipment affect the TO&E?

To answer the primary and secondary question, this study is organized in the following manner. Chapter 1 provides an introduction to the thesis, background on the buildup of armor forces in Vietnam, the terrain in Vietnam, and the threat in Vietnam. Chapter 2 focuses on the doctrinal role of cavalry in the 1960s and how armored cavalry was actually used in Vietnam. Understanding the role of cavalry in Vietnam is necessary to determine which organization had the most effective equipment and organization. Chapter 3 of this thesis analyzes the equipment used by cavalry squadrons and chapter 4 analyzes the organizational structure of cavalry squadron. The organizational structure and equipment of each squadron will be subjectively evaluated using characteristics of cavalry and how suited they were to execute assigned missions. Chapter 5 summarizes the finding and provides some lessons learned which are still applicable for the contemporary operational environment.

This thesis is limited to the organization and equipment of armored divisional and regimental cavalry squadrons which fought in Vietnam. It does not analyze the organization and equipment of air cavalry squadrons or air cavalry troops, light cavalry troops, or separate cavalry troops. This thesis will not evaluate air mobile infantry that fought under the cavalry insignia, even though the use of helicopters in Vietnam did impact the roles and functions of the armored cavalry. Furthermore, this thesis only analyzes combat arms organization and equipment and does not analyze the combat service support organization and equipment of the cavalry squadron.

This study is intended to provide knowledge on how to better organize and equip current US cavalry forces. In 2003, the United States Army began a transformation which includes reorganization of brigade combat teams. One significant change is the modification of the ground cavalry squadrons assigned to brigades and divisions. The new modular brigade table of organization and equipment assigns a cavalry squadron to each brigade combat team. The organization of these new cavalry squadrons is different from the divisional and regimental cavalry squadrons that were organized and equipped to fight a Cold War threat. These contemporary cavalry squadrons require the proper equipment and organization in order to adequately execute its required role in the contemporary operating environment. How should the Army organize and equip a cavalry squadron to fight in the contemporary operational environment? What are the roles and functions of this organization within the current operational environment?

The current operational environment in Iraq and Afghanistan has similarities to the area warfare in Vietnam. By understanding how the cavalry squadrons were organized and equipped in Vietnam War, we can gain insight on how to organize, equip, and employ the contemporary cavalry squadron. No one should draw any direct conclusions based on the experience of cavalry in Vietnam. The intent is to draw upon an historical example to gain perspective on the problem we face today on how to correctly organize and equip the US cavalry to fight an asymmetric threat.

A significant amount of primary and secondary source material is available on armored combat in Vietnam. The single most important body of research on armored warfare in Vietnam was the *Evaluation of U.S. Army Mechanized and Armor Combat Operations in Vietnam*. In 1966, the US Army initiated a project to research the doctrine,

tactics, techniques, materiel, organization, and force mix of US Army mechanized infantry and armor units in the Republic of Vietnam (RVN). A group of Army officers and noncommissioned officers collected data for the study from 11 January 1967 through 28 March 1967. The study resulted in a six volume report. The Army approved the release of the *Evaluation of Armor* report on 4 April 1967. No other single source provides as much data and insight into the organization and roles of armored cavalry as this report. The one limitation of this source was the evaluation occurred in early 1967. It did not provide data on armor operations after 1967.

A follow up study on armor and mechanized forces was published by the Department of the Army in 1971. The three volume report was titled the *Optimum Mix of Armored Vehicles for Use in Stability Operations*. The study was initiated in 1969 to look at armored forces following a change in the nature of war in Vietnam. The purpose of the report was to evaluate the current effectiveness of units with armored type vehicles in Vietnam and recommend changes to meet the threat encountered during stability operations. The report provides a thorough study of US armored forces in Vietnam after 1968, the time period not covered in *Evaluation of Armor*.

Another US Army report on the use of Armor in Vietnam was *The Armor Organization for Counterinsurgency Operations in Vietnam*. In 1964, the US Army initiated a study to evaluate the organization, equipment, support, and employment of Army of the Republic of Vietnam (ARVN) armor units in relation to their capabilities and missions in counterinsurgency in order to determine their adequacy and methods for improving ARVN armor capabilities.⁸ The majority of the input came from US armor and infantry officers who served as advisors to ARVN armor and mechanized units. The

experience of these advisors heavily influenced the tactics, techniques, and procedures used by US armor and mechanized forces in Vietnam.

An additional source of primary material is the Armor Branch professional journal, *Armor* magazine. Numerous articles were written about armor operations in Vietnam from 1965 until 1971. These articles are important because they provide multiple points of view from a wide range of officers. AVRN advisors, company commanders, platoon leaders, staff officers, and regimental commanders wrote articles for *Armor*. Topics varied and included subjects, such as recommended changes to armor organizations, successful tactics and procedures used in combat, and after action reports. Most articles were written by armor officers, potentially giving a somewhat biased view slanted towards overstating the capability of armor in Vietnam.

Armor was an important method for armor officers with combat experience to pass lessons learned and information about armor operations to officers and units preparing for deployment to Vietnam. Today, digital communications, such as the Internet and email, have replaced professional journals as the primary means to pass on lessons learned. As a result, the professional significance of *Armor* magazine has diminished; however, in the late 1960s *Armor* magazine was an important professional magazine that armor officers relied upon.

Another primary source was the manuals that described military doctrine and tactics during the Vietnam War era. Some notable manuals that were pertinent included Field Manual 17-1, *Armor Operations*; Field Manual 17-35, *Armored Cavalry Platoon, Troop, and Squadron*; and Field Manual 17-95, *Armored Cavalry Regiment*. Army doctrine of the 1960s was focused on fighting the conventional-linear threat from the

Soviet Union. Despite the recommendations of officers fighting in Vietnam, the Army made little effort to include doctrine and tactics which applied to the area warfare fought in Vietnam.

Various primary source documents, such as after action reports, debriefing reports, technical reports on vehicles, and interviews, were found in the archives of the Combined Arms Center Library, the online archives of the Center for Military History, and the Texas Tech Vietnam Online Archives. These documents provided important data on what happened in Vietnam.

The most notable secondary source is the book *Armored Combat in Vietnam* written by General Donn A. Starry. General Starry wrote *Armored Combat in Vietnam* from 1973 to 1976 while he was the Commander of the US Armor School. Previously, he served as the commander of 11th Armored Cavalry Regiment in Vietnam. General Starry's book draws from the official war records of armored units, his personal experiences, and interviews of veterans from the Vietnam War. Another secondary sources that illustrate Armor's role on the battlefield in Vietnam is *Vietnam Tracks*, written by Simon Dunstan. *Vietnam Tracks* provides a general history of armor starting with the French use of armor during the French Indo-China War through the North Vietnamese victory in 1975. *Vietnam Tracks* includes not only US armor history, but allied armor forces, such as the Australian and Koreans, the AVRN, and the North Vietnamese. As a civilian with no known ties to Vietnam, Dunstan is presumably less bias than General Starry, who was involved in the war.

Two more notable books written by troopers who served in Vietnam are *Ringed in Steel* and *A Hundred Miles of Bad Road*. *Ringed in Steel* by Michael D. Mahler recounts

the experiences of an armor major who served in the 11th Armored Cavalry Regiment. *A Hundred Miles of Bad Road* by Dwight Birdwell and Keith Nolan tells the story of a C Troop, 3rd Squadron, 4th Cavalry during the Tet offensive from the viewpoint of an enlisted trooper. Both of these books provide excellent firsthand accounts and perspectives of cavalry troopers in Vietnam.

The history of US cavalry in Vietnam began with the buildup of conventional forces in Vietnam. The initial deployment of conventional troops began in March and April of 1965 with the deployment of several Marine battalions. On 20 April 1965, a group of high level US officials, which included William C. Westmoreland, Commander of the US Military Assistance Command, Vietnam (MACV), and Secretary of Defense Robert McNamara, planned to send an additional 40,000 troops to Vietnam by June, double the number already in Vietnam.⁹ President Lyndon Johnson endorsed the plan for additional troops. By July 1965, President Johnson believed that 600,000 troops would be required in Vietnam. He stated publicly on 28 July 1965:

I have asked the commanding general, General Westmoreland, what more he needs to meet this mounting aggression. He has told me. And we will meet his needs.¹⁰

President Johnson's decision for a troop buildup in Vietnam enabled the deployment of several Army infantry divisions to Vietnam. At the request of the division commanders, General Westmoreland reluctantly agreed to allow the divisional armored cavalry squadrons to deploy as part of these organizations.

The use of US armor in Vietnam began with apprehension from many senior leaders. When America initiated the buildup of conventional forces in Vietnam, little consideration was given to introduce armored warfare. Invalid assumptions persisted

from the poor use of armor in close terrain during the Korean War, the destruction of French armor in Indochina, and a misunderstanding of the terrain in Vietnam.

Furthermore, the newest technology in the Army, the helicopter, was considered by the infantry to be the next decisive technology on the battlefield.

Two of the most senior army leaders during the Vietnam War, General Harold K. Johnson, Chief of Staff of the Army and General Westmoreland, were initially against the buildup of armor forces in Vietnam. In early 1965, the Army began planning for 1st Infantry Division's deployment to Vietnam, which included their reorganization for combat. The Department of the Army instructed the 1st Infantry Division to get rid of its two tank battalions and its mechanized infantry battalions. The justification for this decision was provided by General Johnson in a message on 3 July 1965 to General Westmoreland. General Johnson overruled the recommendation from his staff that the 1st Infantry Division retain one tank battalion. General Johnson reasoned:

A. Korean experience demonstrated the ability of the oriental to employ relatively primitive but extremely effective box mines that defy detection. Effectiveness was especially good in areas where bottlenecks occurred on some routes. Our tanks had a limited usefulness, although there are good examples of extremely profitable use. On balance, in Vietnam the vulnerability to mines and the absence of major combat formations in prepared positions where the location is accessible lead me to the position that an infantry battalion will be more useful to you than a tank battalion, at this stage.

B. I have seen few reports on the use of the light tanks available to the Vietnamese and draw the inference that commanders are not crying for their attachment for specific operations.

C. Distances and planned areas of employment of the 1st [Infantry Division] are such that the rapid movement of troops could be slowed to the rate of movement of the tanks.

D. The presence of tanks formations tends to create a psychological atmosphere of conventional combat, as well as recalls the image of French tactics in the same area in 1953 and 1954.¹¹

General Westmoreland agreed with General Johnson's decision to limit the amount of armor deployed to Vietnam. In response to General Johnson, General Westmoreland stated "Vietnam is no place for either tank or mechanized infantry units."¹² Although General Westmoreland and Johnson were against use of tanks in Vietnam, the 1st and 25th Infantry Division commanders requested the deployment of tanks with their divisions. Despite reservations, General Johnson eventually consented to allow tanks to deploy with the 1st Infantry Division's divisional cavalry squadron, 1st Squadron, 4th Cavalry.

The first armor was introduced to Vietnam almost by accident when a Marine battalion deployed a tank platoon in 1965 without the knowledge of the US Military Assistance Command, Vietnam. On 9 March 1965, the 3rd Platoon, B Company, 3rd Marine Tank Battalion, deployed from a landing craft onto Red Beach 2 at Da Nang, becoming the first US armored force committed in Vietnam.¹³ At the time, the MACV was not aware of the tank platoon's presence. The MACV requested two Marine Battalion Landing Teams, but did not realize tanks were part of the landing teams. When US Ambassador Maxwell D. Taylor gained knowledge of the deployment of tanks he stated this equipment was "not appropriate for counter-insurgency operations."¹⁴

The first US Army armor unit to deploy was the 1st Squadron, 4th Cavalry of 1st Infantry Division in October 1965. Eventually, the US Army deployed a total of nine armored cavalry squadrons (three regimental squadrons and six armored divisional cavalry squadrons) and three armor battalions during the Vietnam War. The initial roles and uses of mechanized and armor units were limited. As armored cavalry units began to prove their usefulness in combat, commanders began to expand their roles. Late in 1965,

General Westmoreland directed the deployment of the 11th Armored Cavalry Regiment, the only brigade-sized armored unit to deploy to Vietnam.

On 12 December 1966, the Army approved a plan for a detailed “study in depth of the doctrine, tactics, techniques, materiel, organization and force mix of US Army mechanized infantry and armor units in the Republic of Vietnam.”¹⁵ The report, known as the *Evaluation of U.S. Army Mechanized and Armor Combat Operations in Vietnam*, was the most comprehensive study on the use of armor in Vietnam. The report was vital in correcting misconceptions about the application of armor in Vietnam.

The *Evaluation of Armor Operations* concluded that while tank and mechanized infantry units were playing a significant role in Vietnam, cavalry units, both ground and air, were essential elements to the important business of finding, pursuing, and destroying the enemy.¹⁶ The report also found that there was a wide variation of organization and equipment among the deployed squadrons. One of the goals of the report was to recommend standardized cavalry squadrons to eliminate the variation between units in order to simplify planning and logistics. The *Evaluation of Armor Operations* validated the presence and requirement for armored units in the Vietnam War. Its findings prompted General Westmoreland to request more armored and mechanized units and marked the final acceptance of armor on the battlefields of Vietnam.¹⁷

Terrain was a major factor in determining the type and structure of deploying forces. A common misconception existed within the US military in the early 1960s that only light infantry units were suitable to fight in Vietnam and that the terrain in Vietnam precluded the use of armor. Many US Army armor and infantry officers who were advisors to ARVN armor and mechanized units knew that this was an invalid assumption.

Starting in 1962, US Army provided advisors to ARVN mechanized and armor units. *Armor Organization for Counterinsurgency Operations in Vietnam*, based on input from ARVN advisors, provided valuable insight on the effects of terrain on armor operations and the threat to armor in Vietnam. In 1966 *Armor* magazine published an article by Lieutenant Colonel Raymond R. Battreall titled “Armor in Vietnam” which described the terrain and its effect of armor operations. At the time he wrote the article, Battreall was the senior armor advisor for the MACV. The consensus of officers with experience in Vietnam was that terrain would restrict movement in some areas, but did not prevent the use of armor.

The impact of terrain on mobility varied by geographic region and season. South Vietnam had four geographic regions: the highlands located in the north and central portions of South Vietnam, the plateaus of the central highlands, the coastal plains, and the Mekong Delta region in the south (figure 1). The terrain and weather in each of these regions had different impacts on armored operations (figure 2). South Vietnam had two climatic seasons which affected off-road movement. The two seasons were known as the Northeast and Southwest Monsoon season. The Northeast Monsoon season brought heavy rains to the north in the winter and the Southwest Monsoon Season, the wet season, brought heavy rains to the south in the summer.¹⁸

The new delta region was north of the Saigon River and was sometimes referred to as the piedmont region. This region was devoid of canals and major rivers, and covered by large forests and rubber plantations. The ground in this area supported vehicle movement year round; however the dense vegetation and rubber plantations reduced the

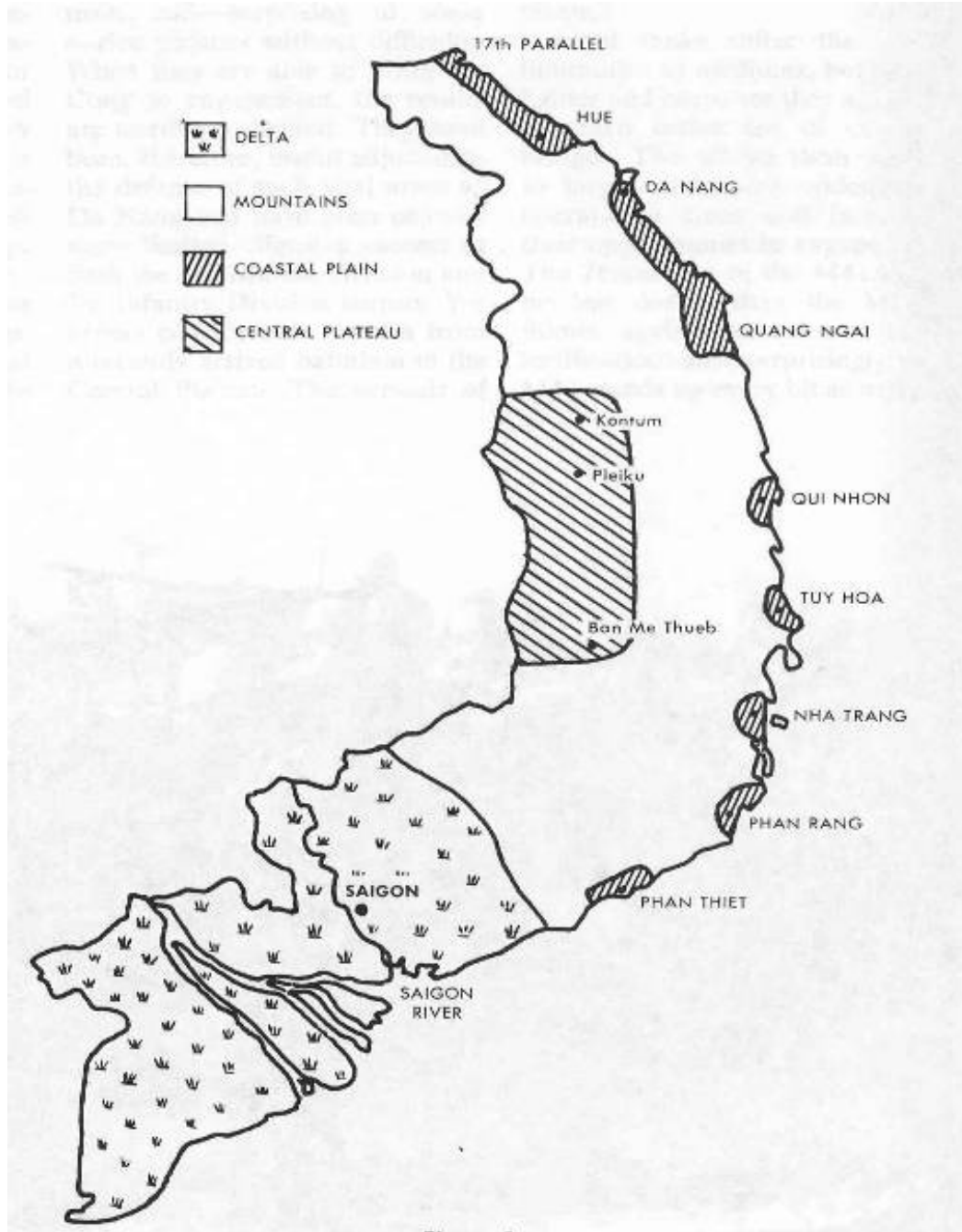


Figure 1. Geographic Regions of South Vietnam

Source: Raymond R. Battreall Jr., "Armor in Vietnam," *Armor* 75, no. 3 (May-June 1966): 5.

effectiveness of armor. Tanks and M113s could generally push through the vegetation, but were highly vulnerable to concealed infantry with antitank weapons. The fields of fire were better in the rubber plantations, but the rubber trees restricted movement. The rubber trees were spaced far enough apart to fit the width of an M113, but a mature rubber tree was too big for an M113 to push over, restricting their movement to the lanes created by the trees. Changing direction within the rubber plantation was difficult for a M113.¹⁹ The new delta region could support tank and mechanized operations in most areas.

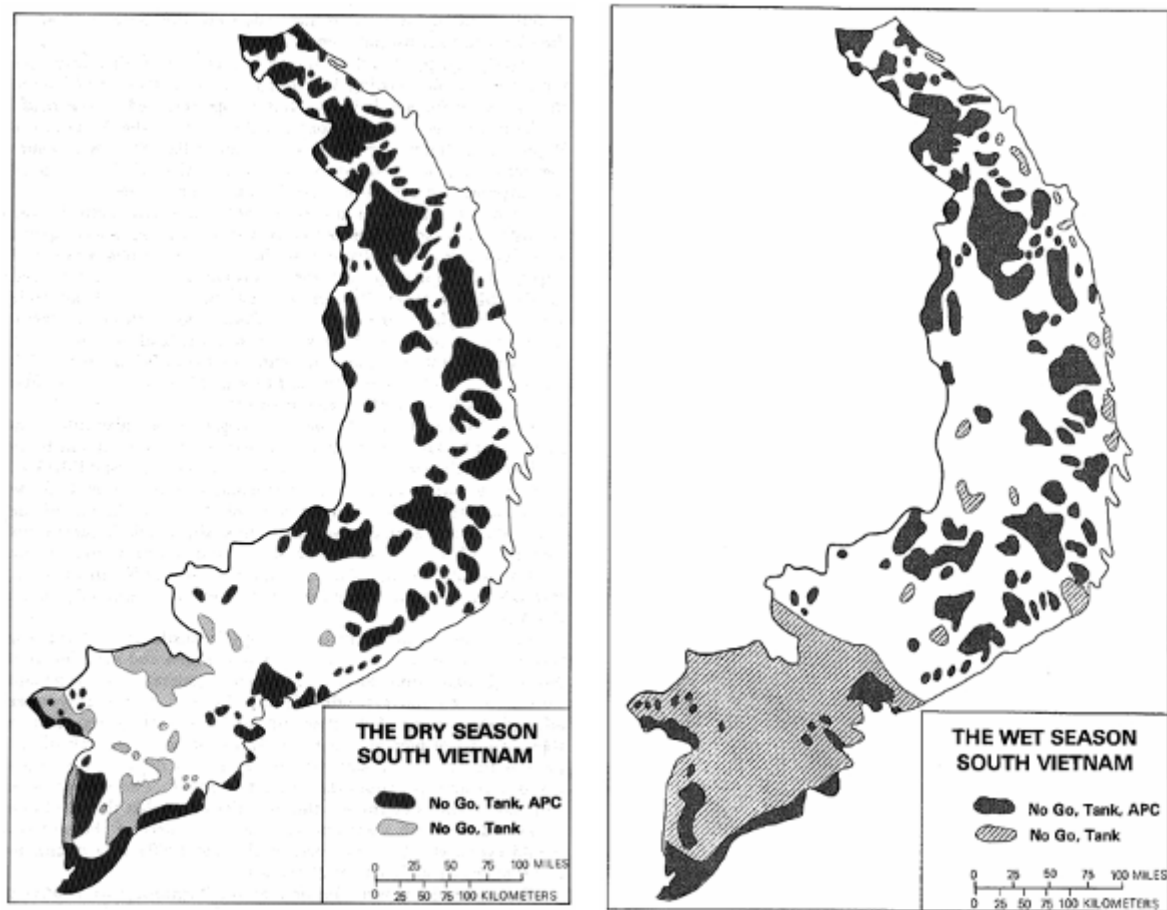


Figure 2. Restrictive Terrain in South Vietnam

Source: Donn A. Starry, *Armored Combat in Vietnam*, (United States: Arno Press, 1980), 11.

The highlands region was the least hospitable geographic area for vehicle movement in South Vietnam. The northern two-thirds of South Vietnam consisted of the rugged, jungle-covered Annamite Mountains. The mountains within this region severely restricted the mobility for both mechanized vehicles and tanks due to the lack of roads, steepness of slopes, and presence of thick vegetation. A limited number of inferior and easily interdicted roads and trails existed in the valleys. The jungle-covered mountain terrain was hostile to both mounted and dismounted movement. Few military operations were conducted in this area.

The coastal plain was a noncontiguous region located along the northern two-thirds of South Vietnam's coast. It was broken up in several areas by mountains that extend to the sea. From the coast it had a maximum inland depth of about twenty miles. The coastal plain had a single sandy strip backed up by rice paddies. A single range of open hills separated the coastal plains from the highlands. The terrain in the coastal areas supported the cross-country movement of M113s and tanks; however, unfordable streams, canals, and weak bridges limited tank movement.

The central plain was located west of the Highland region in the center of South Vietnam. It extended from the Cambodian border to the Annamite Mountains. The central plain was covered with forests and tall savannah grass. Very few rivers existed in the central plain region. The central plain had excellent cross-country mobility for armored and mechanized vehicles.

While the terrain restricted armor and mechanized movement in many areas, over 46 percent of the country could be traversed all year round by tanks and 63 percent of the country supported the movement of M113s year round (table 1).²⁰ In some areas M113s

could operate on over 90 percent of the terrain. Even in areas that restricted movement, mitigation measures such as detailed analysis of the terrain during planning, experienced operators who were familiar with the terrain, and using the right type of equipment could enhance the movement of armor units.

Table 1. Movement Capabilities by Corps Tactical Zone

Corps Tactical Zone	Movement Capabilities in Percent			
	Tanks		Armored Personnel Carriers	
	Wet	Dry	Wet	Dry
I	36	44	44	44
II	54	55	55	55
III	73	92	93	93
IV	00	61	87	87

Source: Combat Operations Research Group, *Evaluation of U.S. Army Mechanized and Armor Combat Operations in Vietnam*, vol. 1, *Basic Report* (Washington, DC: Department of the Army, 1967), I-15.

The threat in Vietnam was another major factor in determining the right organization and equipment for armored cavalry. The US enemy in South Vietnam fell into two groups, the Viet Cong and the North Vietnamese Army. Early in the Vietnam War, the Viet Cong were guerrilla and conventional units comprised primarily of indigenous personnel from South Vietnam. An increasing number of North Vietnamese troops were used to replace Viet Cong losses later in the war. Officially the Viet Cong was the armed wing of the National Liberation Front, an extension of the *Lao Dong* Party of North Vietnam.²¹ The Viet Cong were further divided into main, local, and militia forces. The main and local forces were well-organized and equipped regular infantry

units. The Viet Cong militia forces were usually poorly trained and equipped and were only capable of small unit operations. They were usually used as intelligence gatherers, porters, or as reinforcements or replacements for main and local forces. The North Vietnamese Army (NVA) consisted of conventional army units trained and equipped in North Vietnam who infiltrated into South Vietnam. The North Vietnamese Army and Viet Cong main force units had similar capabilities and equipment. Command and Control of both NVA and Viet Cong units was conducted by the Central Office of South Vietnam (COSVN).

Hanoi's²² strategy shifted in 1965 and again in 1968. Prior to 1965, Hanoi used a strategy revolutionary guerrilla war strategy centered on the Viet Cong forces. In 1965 Hanoi shifted to a regular force strategy to coincide with the buildup of US forces in South Vietnam. Following the defeat of the Viet Cong and NVA during the Tet offensive, Hanoi shifted to a neo-revolutionary guerrilla strategy. The defeat of North Vietnamese and Viet Cong forces during the Tet offensive resulted in huge losses of regular and guerrilla forces, forcing Hanoi's strategy change in 1968.²³ The change in strategy resulted in a very different type of war for US troops after 1968.

A major consideration for Hanoi throughout all phases was strategic mobility. Strategic mobility, as defined by the communists, was the massing of sufficient maneuver battalions throughout the depth of the area of operations to pose threats in widely separated areas (figure 3).²⁴ To counter the enemy's strategic mobility, the US required units with superior tactical mobility over the enemy.

The Viet Cong and the North Vietnamese Army did not have a significant armored warfare capability in South Vietnam during the period that US conventional forces fought in South Vietnam.²⁵ Only a few minor engagements between US and North Vietnamese armored forces occurred during the war. The bulk of the enemy NVA and Viet Cong main force units were lightly equipped infantry units (figure 4).

Both the *Armor Organization for Counterinsurgency Operations in Vietnam* report and the *Evaluation of Armor Operations* report assessed the anti-armor capabilities of the enemy. During the evaluation of AVRN armor operations the Viet Cong employed the following anti-armor weapons against ARVN armored vehicles: 57-millimeter recoilless rifles, 75-millimeter recoilless rifles, antitank hand grenades, pressure and electrically detonated mines, and 82-millimeter RPG-2 antitank rockets.²⁶ Mines were the most effective weapons used by the enemy against armor vehicles. Over 70 percent of all US armored vehicle losses during the war were the result of mines.²⁷ Mines also caused a higher percentage of casualties and a higher percentage of destroyed vehicles than other weapon systems. The next most effective weapon was the 57-millimeter recoilless rifle. From January 1966 to January 1967 57-millimeter recoilless rifles accounted for forty-five damaged or destroyed armored vehicles (tanks and armored personnel carriers) compared to twenty-one armored vehicles damaged or destroyed by RPG.²⁸ The higher success rate of the recoilless rifles can be attributed to a less capable RPG-2 weapon system and the availability of 57-millimeter recoilless rifles; 57-millimeter recoilless rifles were employed down to the company level.

The RPG became more effective later in the war when the improved RPG-7 model replaced the RPG-2. The 75-millimeter recoilless rifle was also a capable weapon,

but employed in limited numbers. It was found only within the heavy weapons company of a battalion or the heavy weapons battalion within the regiment. Only North Vietnamese Army and main force Viet Cong units had anti-armor weapons. The Viet Cong militias were typically not equipped with antitank weapons other than mines.

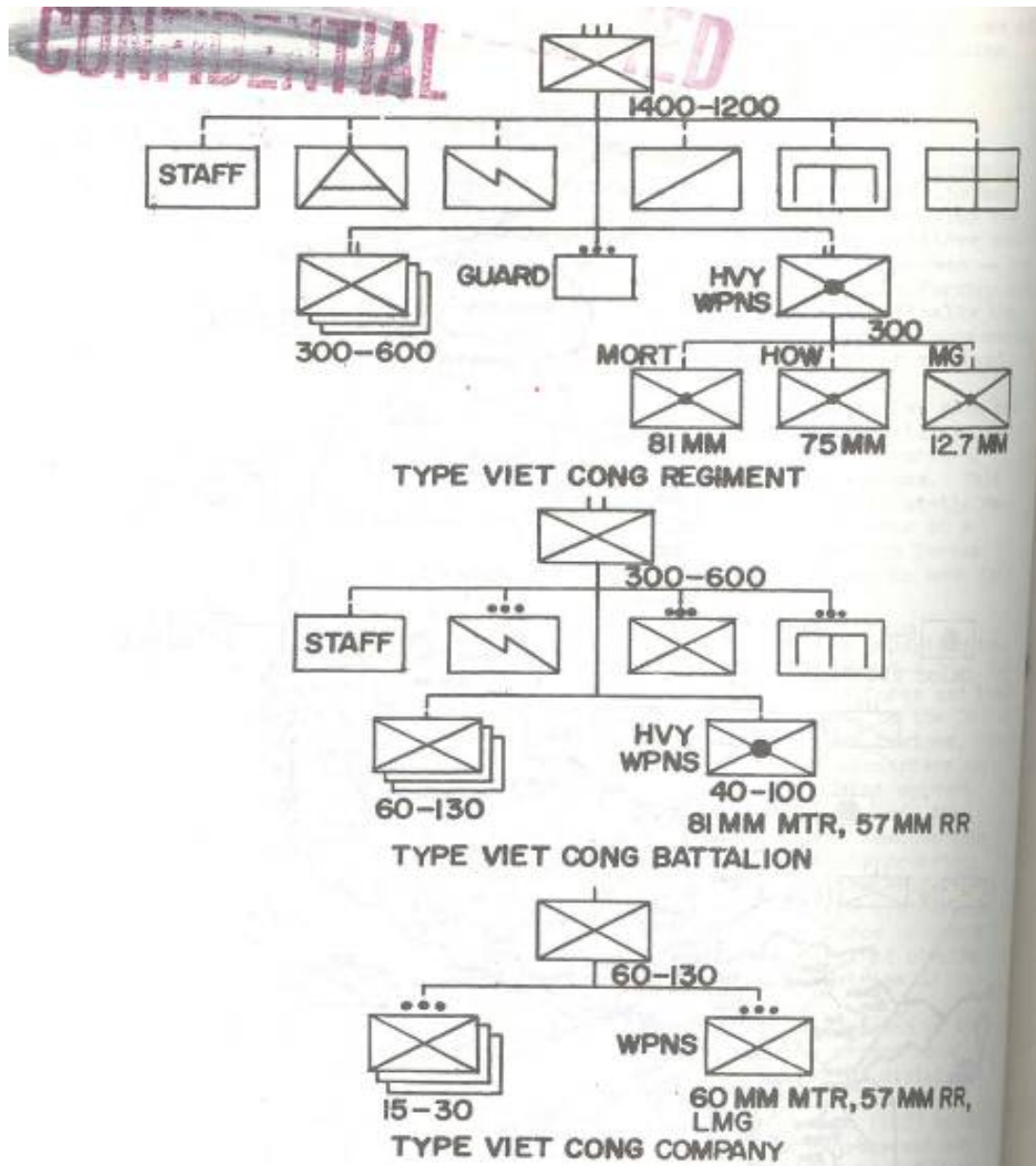


Figure 4. Typical Order of Battle for a Viet Cong or NVA Infantry Regiment

Source: Combat Operations Research Group, *Evaluation of Armor*, vol. 1, I-A-6.

The Viet Cong and North Vietnamese Army used similar tactics, avoiding contact with armored forces when possible unless they were in well-prepared defenses or ambush positions.

Intelligence reports based on interrogation of captured [Viet Cong] and those voluntarily returning to government control revealed that the [Viet Cong] feared ARVN armor. The squadrons reported that the VC would attempt to avoid engagement with [armored personnel carriers] if possible unless they had selected the battle site and carefully prepared their defenses or ambush.²⁹

The NVA and Viet Cong employed linear and in-depth ambushes. Linear ambushes were employed along roads in restricted terrain and in defiles. Ambushes in depth consisted of multiple units deployed along likely avenues of approach. An ambush in depth generally required a company size force or larger. Multiple antitank weapons were employed in an ambush. The most successful enemy tactic was the use of command-detonated mines along routes and likely avenues of approach. Despite their efforts, the Viet Cong and North Vietnamese Army were not able to restrict the freedom of movement of ARVN and US armored vehicles.

¹U.S. Department of the Army, Field Manual 17-95, *Cavalry Operations* (Washington, DC: Department of the Army, 1996), 1-1.

²Ibid.

³Ibid.

⁴The U.S. Army is broken down into branches which are the proponents for specific functions such as infantry, armor, transportation, and field artillery.

⁵U.S. Department of Defense, Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms* (Washington, DC: Department of Defense, 2001), 390.

⁶U.S. Army Combined Arms Center, *CALL Thesaurus* [database online] (Fort Leavenworth, KS: 2005); available from <http://call.army.mil/thesaurus.asp>; Internet; accessed 24 October 2005.

⁷Simon Dunstan, *Vietnam Tracks: Armor in Battle, 1945-1975* (Novato, CA: Presidio Press, 1982), 71.

⁸Army Concept Team in Vietnam, *Armor Organization for Counterinsurgency Operations in Vietnam* (Washington, DC: Department of the Army, 1965), vii (hereafter cited as *Armor Organization for Counterinsurgency*).

⁹Stanley Karnow, *Vietnam: A History* (New York, NY: Penguin Books, 1983), 435.

¹⁰*Ibid.*, 441.

¹¹Donn A Starry, *Armored Combat in Vietnam*, (Salem, NH: The Ayer Company, 1982), 56.

¹²*Ibid.*

¹³A platoon of Marine tanks was deployed to a Vietnamese Navy PT base at Monkey Mountain to act as a reaction force in December 1964. These tanks were never committed and re-embarked a week after arrival. Dunstan, 82.

¹⁴Dunstan, 62.

¹⁵Combat Operations Research Group, *Evaluation of U.S. Army Mechanized and Armor Combat Operations in Vietnam*, vol 1, *Basic Report* (Washington, DC: Department of the Army, 1967) (hereafter cited as *Evaluation of Armor Operations*).

¹⁶Starry, 85.

¹⁷Dunstan, 68.

¹⁸*Armor Organization for Counterinsurgency*, 33-34.

¹⁹*Ibid.*

²⁰Starry, 222.

²¹The Lao Dong Party was North Vietnams Communist Party. *Evaluation of Armor Operations*, vol. 1, I-A-4.

²²Hanoi was the capital of North Vietnam and connotes the leadership and policy makers of the Lao Dong party.

²³John Schlight, ed., *Second Indochina War Symposium: Papers and Commentary*, (Washington, DC: Center of Military History, 1986), 99.

²⁴*Evaluation of Armor Operations*, vol. 1, I-A-4

²⁵Following the withdraw of U.S. forces from South Vietnam, the NVA returned to a regular army strategy that utilized a large armored force to defeat the ARVN.

²⁶*Armor Organization for Counterinsurgency*, 28-29.

²⁷Dunstan, 98.

²⁸*Armor Organization for Counterinsurgency*, 29.

²⁹*Ibid.*

CHAPTER 2

CONVENTIONAL CAVALRY ROLES AND MISSIONS VS. AREA WARFARE ROLES AND MISSIONS

When America entered into the Vietnam War, the doctrine and tactics for armor forces were not well suited for area warfare in the restrictive terrain of Vietnam. Although not specifically mentioned in US doctrine, the Army designed armored cavalry organizations to counter the Soviet threat in the European theater. The US army intended cavalry forces to fight on the large rolling plains of Europe against a comparable mechanized force. Very little impetus was given for preparing armored cavalry squadrons to fight an asymmetric threat in a restrictive-terrain environment. Only a few pages of the armor doctrinal manuals of the early 1960s spoke about conducting jungle or limited warfare. While there was a basic doctrine from which to build upon, US cavalry units arriving early to the Vietnam War had to invent tactics and techniques and then convince the Army the tactics worked through combat testing.¹

Before describing the role of the cavalry in Vietnam, one needs to first understand the US Army doctrinal role of the armored cavalry. The US Army doctrine of the 1960s focused cavalry squadrons as the primary eyes and ears for the maneuver commander. The fundamental purpose of cavalry was to perform reconnaissance and to provide security for their higher headquarters. Cavalry squadrons were also assigned economy of force missions. Reconnaissance, security, and economy of force missions performed by cavalry squadrons were performed in support of a larger maneuver force. Doctrinally, Cold War era cavalry squadrons were intended to conduct missions as an independent squadron working for a division commander or as part of an armored cavalry regiment

which was assigned to a corps. In doing so, cavalry facilitated the corps or division commander's ability to maneuver divisions, brigades, and battalions and to concentrate superior combat power against the enemy at the decisive time and point.² Field Manual 17-1, *Armor Operations*, the primary doctrine manual for armored forces of the US Army stated: "The armored cavalry squadron of the armored, mechanized infantry, infantry, and airborne division and of the armored cavalry regiment is the basic unit used for reconnaissance, security, and economy of force missions."³ The doctrine and tactics on employment of cavalry squadron remained relatively unchanged throughout the Cold War. Even the Vietnam War did little to change cavalry doctrine.

The doctrinal missions for which armored cavalry squadrons were organized and equipped to conduct did not fit the situation in Vietnam. Doctrinal cavalry reconnaissance operations required a cavalry squadron to perform reconnaissance for a higher headquarters in order to collect information on the enemy and terrain within a specified zone or area, or along a specified route. Cavalry organizations typically performed reconnaissance over a large frontage. The smallest element an armor cavalry organization normally looked for in a conventional situation was a platoon.⁴ In the restrictive terrain of Vietnam, the enemy often consisted of small dismounted teams or squads who would flee or hide rather than fight in the face of an armored force. Reconnaissance against this type of enemy required large numbers of dismounted personnel which armored cavalry units did not have. In general, infantry forces were better suited for conducting reconnaissance operations in Vietnam.⁵

During security operations, a cavalry squadron conducted a screen or guard for a larger maneuver force. A cavalry squadron could also conduct a cover mission when

operating as part of an armored cavalry regiment. The primary purpose of a screen was to provide early warning to the main body. A screening force was also used to destroy enemy reconnaissance and impede and harass the enemy main body with either or both indirect and direct fires. Screen missions were defensive in nature and largely accomplished by establishing a series of observation posts and conducting patrols to ensure adequate surveillance of the assigned sector. A guard force accomplished all the tasks of a screening force and prevented enemy ground observation of and direct fire against the main body. A covering force accomplished all the tasks of screening and guard forces and operated apart from the main body to develop the situation early in order to deceive, disorganize, and destroy enemy forces.⁶ All of the security missions performed by cavalry squadrons were intended for a linear battlefield. A mechanized cavalry squadron's organization or equipment was not sufficient to cover multiple avenues of approach against the dispersed dismounted enemy encountered in Vietnam.

The third set of doctrinal tasks given to a cavalry squadron falls under the economy of force role. Economy of force was not a mission; it was the allocation of minimum-essential combat capability to supporting efforts, with attendant degree of risk, so that combat power could be concentrated against the main effort.⁷ The combined arms organization of the cavalry made them ideal units for offensive and defensive missions as an economy of force. Commanders assigned cavalry units to attack or defend over large areas against a numerically superior enemy in order to conserve combat power enabling the main body to mass forces elsewhere. Although the tactics for conducting an attack or defend mission required modification due to the restrictive terrain and light infantry

enemy, the economy of force was one role that remained relevant for the cavalry in Vietnam.

The tactical situation in Vietnam did not permit divisions and corps to employ cavalry squadrons in cavalry's primary doctrinal roles of reconnaissance and security. As a result, division and corps typically used cavalry squadrons in a maneuver battalion role. According to the *Evaluation of Armor Operations*,

Armored Cavalry units are being increasingly employed in roles previously assigned to tank and infantry maneuver battalions in addition to the traditional reconnaissance, security, and economy of force roles. This change has evolved due to the nature of the enemy, the concept of area war and the balanced combined arms structure of the armored cavalry squadron. . . . Extensive firepower and combat strength of the armored cavalry squadron have combined to dictate its more effective use in the role of a well balanced maneuver battalion, rather than in its tradition roles.⁸

Cavalry squadrons were frequently task organized with infantry companies to further their use as maneuver battalions during the Vietnam War.

The lack of clear tactics and doctrine for armored cavalry's use in restricted-terrain area warfare and the lack of armor experience by many senior leaders limited the scope of cavalry operations early in the war. Cavalry forces had to prove their usefulness to senior commanders and staffs prior to expanding the scope of cavalry operations. The missions and roles of armored cavalry evolved over time as units and commanders gained experience. By the time US military began to withdraw from Vietnam, armored units were actually required to stay in Vietnam after their parent headquarters had departed. "As divisions or brigades left the country, their armored units remained behind. The mobility and firepower of armored units made them the logical choice for operations over extended areas, and rearguard, delay, and economy of force roles were traditional armor specialties, particularly for cavalry."⁹ In 1971, armored and mechanized units made up 54

percent of the ground forces in Vietnam.¹⁰ Armored cavalry went from being excluded from the initial troop lists to being the centerpiece of combat forces at the end of the war.

The missions and roles for cavalry changed not only because the US Army lacked doctrine for cavalry's employment during area warfare, but because the tactical situation in Vietnam varied greatly depending upon the time period and location. While some units slugged it out with guerrilla forces in the Mekong Delta region, other units clashed in large engagements with North Vietnamese regiments in the highland region. The enemy situation also changed over time. After a huge defeat of the North Vietnamese Army's and Viet Cong's conventional attacks during the Tet offensive, the North Vietnamese and Viet Cong returned to guerrilla warfare and did not attempt another large offensive operation until 1972. Each Corp Tactical Zone had a unique tactical problem which required a different role for the cavalry units.

The initial cavalry squadrons deployed to Vietnam were sent in piecemeal. The 1st Squadron, 4th Cavalry, the divisional cavalry squadron of the 1st Infantry Division was the first armored cavalry squadron deployed to Vietnam. 1st Squadron, 4th Cavalry deployed in October 1965; however, 1st Infantry Division attached each of its three ground cavalry troops to the division's three infantry brigades. The squadron, based at Phu Loi about twenty-five miles north of Saigon, was left with only its air cavalry troop under squadron control. Under the orders of the Military Assistance Command, Vietnam, which had a "no tanks in the jungle attitude,"¹¹ 1st Infantry Division removed the tanks from the cavalry troops and retained them with the squadron headquarters at Phu Loi.¹² The first squadron level operation with ground troops did not take place until six months after the arrival of the squadron headquarters.¹³

The next squadron the US Army deployed to Vietnam was 3rd Squadron, 4th Cavalry, the divisional cavalry squadron of the 25th Infantry Division. 3rd Squadron based itself in II Corps Tactical Zone northwest of Saigon at Cu Chi. The experience of 3rd Squadron was similar to 1st Squadron's; its ground troops were attached to other brigades. C Troop, 3rd Squadron arrived in December 1965 attached to the 3rd Brigade, 25th Infantry Division. C Troop did not return to the squadron's control until 1967. Despite the employment of the ground cavalry troops piecemeal, the cavalry troops immediately began to prove their worthiness in combat.

One of the first missions assigned to the troops was perimeter defense. This mission was different from the security mission or economy of force defend mission assigned to cavalry units during conventional operations. Although using armored cavalry for perimeter defense was not the optimal use of cavalry, it was a valid and necessary role. Cavalry units were not the only armored forces assigned perimeter security; tank and mechanized units were also used in this role. However, armored cavalry was deployed prior to mechanized and tank units; therefore, they were the first used in this role and were the first to develop tactics for perimeter defense.

The nonlinear battlefield required US forces to operate out of fortified bases. The US military established permanent base camps, fire support bases, and forward combat bases.

A major innovation of the Vietnam War was the fire support base. Because there were no well-defined battle lines, fire support of maneuver units could not always be accomplished from secure, behind the line positions or from major base areas. Often, positions had to be secured in enemy-dominated territory. By late 1966 the usual procedure was to establish fire support bases containing headquarters elements, medical facilities, and other support activities, as well as supporting

light, medium, and sometimes heavy artillery. Setting up such bases became the routine opening phase of search operations.¹⁴

US troops prepared for and supported offensive operations from these fire support bases. Some of the bases were well-fortified permanent sites and others were temporary, with hastily prepared protective obstacles and fighting positions. Unsure of how to employ armored forces early during the war, many commanders opted to use cavalry troops to bolster the perimeter defenses of these bases. Later in the Vietnam War, commanders avoided using armored cavalry for perimeter defense when possible.

Armored cavalry troopers developed tactics, techniques, and procedures to improve their survivability during perimeter defense. One technique developed for survivability was the use of an RPG screen or cyclone fencing as stand-off protection from RPGs.¹⁵ The fences were erected at temporary laager sites¹⁶ and at more permanent camps. When assets and time were available, crew members constructed vehicle and individual fighting positions. Individual positions were connected to the vehicle location so crewmen could reach their vehicles without exposing themselves to enemy fire. Unlike conventional operations, vehicles were placed close together to provide maximum overlapping fires and prevent infiltration. Perimeters were usually placed in open terrain to maximize the standoff advantage of the cavalry's weapons. If open areas were not available, armored vehicles could be used to crush vegetation around the perimeter to create better fields of fire. During stand-to,¹⁷ crews sometimes conducted a reconnaissance by fire technique, known as a mad minute, in an attempt to trigger a response by an infiltrating enemy and discourage further enemy activity.¹⁸ In an attempt to capitalize on the mobility of armored cavalry, commanders often employed troops and platoons assigned to perimeter security as rapid reaction forces.

The first major engagement of the war by an armored cavalry unit came on 11 November 1965, at a temporary fire support base at Ap Bau Bang located north of Saigon in III Corps Tactical Zone (figure 5). A Troop, 1st Squadron, 4th Cavalry minus their nine tanks left at Phu Loi was attached to the 2nd Battalion, 2d Infantry of the 1st Infantry Division. A Troop, A Company of the 2nd Battalion, an artillery battery and the 2nd Battalion command group established a defensive perimeter just south of the Ap Bau Bang village.

Minutes after stand-to the Viet-Cong began a prep of the objective with mortar fire on the American fire support base. Thirty minutes later the Viet Cong assaulted the fire base. While the troopers maintained a base of fire from the perimeter, the Armored Cavalry Assault Vehicles (ACAV) of 3d Platoon, A Troop moved out of the perimeter and counterattacked the assaulting enemy. The surprise and shock effect created by an armored counterattack repelled the initial assault of the Viet Cong. For the next six hours, the Viet Cong continued to assault the fire base from multiple directions. Throughout the fight, ACAVs were repositioned to strengthen weak points on the perimeter. After suffering heavy losses from the combined arms fire of the American forces, the enemy withdrew.¹⁹ The mobility, firepower, protection, and shock effect of the armored cavalry was a vital part of the fire base defense. A Troop had begun to validate the use of armored cavalry in Vietnam.

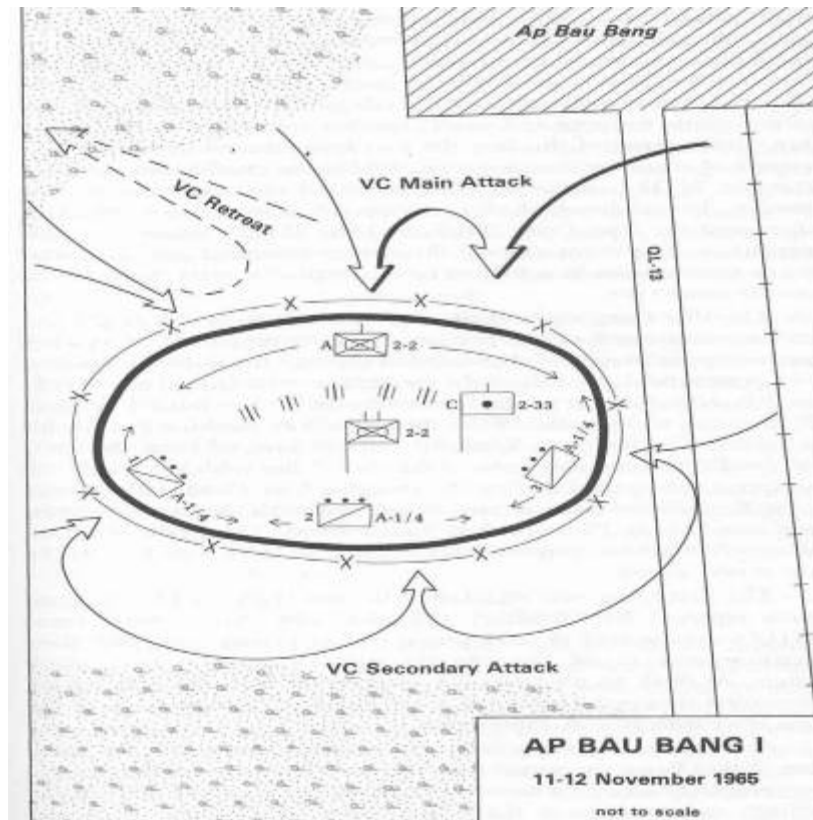


Figure 5. Battle of Ap Bau Bang 1

Source: Starry, 61.

Another primary role of the armored cavalry during the Vietnam War was lines of communication (LOC) security. When General Westmoreland initially requested the deployment of 11th Armored Cavalry Regiment, his intent was to use them to perform LOC security.²⁰ Again, this was not the optimal use of armored cavalry, but it was a valid and necessary role. The nonlinear warfare of Vietnam required LOC security to ensure the North Vietnamese Army and Viet Cong did not interdict US supply lines. The vulnerable logistical convoys required an escort by combat forces to protect the convoy from ambushes. The continuous movement of convoys over land lines of communication was essential for the success of military operations in Vietnam.²¹

LOC security was a role that cavalry has historically filled, but in the modern era LOC security was a mission normally fulfilled by military police units. LOC security included the tasks of route security and convoy escort. However in Vietnam, not enough military police forces were available in Vietnam to accomplish these tasks. Furthermore, the military police was not properly equipped to handle the complexity or intensity of enemy ambushes, especially prior to 1968. In 1968 military police units were issued the V-100 Commando armored car, increasing their firepower and survivability.²² Nearly all cavalry squadrons deployed were assigned lines of communication security in 1966 and 1967. Although the amount of time cavalry units spent conducting LOC security missions was reduced later in the war, cavalry squadrons were constantly assigned this duty throughout the Vietnam War.

The cavalry developed different techniques for LOC security. In the highlands of the II Corps Tactical Zone, “the primary technique used was to establish strong points along the road at critical locations, and each morning had a mounted unit sweep a designated portion of the route.”²³ The 1st Squadron, 10th Cavalry, spent most of its five-year tour in Vietnam, 1966 to 1971, securing the road network in the Pleiku area.²⁴ Another technique was to provide an armored escort for a convoy. A tank section often led because they were less likely to be killed by a mine hit and provided maximum firepower to counter an ambush. Another technique used by cavalry units was to conduct reconnaissance in force along the route. The 2nd Squadron, 1st Cavalry, used a system of offensive patrolling several thousand meters from main routes. This tactic made better use of armor’s offensive capability and reduced the predictability of route clearing.²⁵ The tactics and techniques chosen were based on the tactical situation.

On 20 November 1966, the cavalry once again established their value while conducting a convoy escort mission. The 1st Squadron, 11th Armored Cavalry Regiment commander sent a scout platoon from C Troop to escort a supply convoy from Long Bing to the regimental base camp eleven kilometers south of Xuan Loc . The convoy departed at 0930 hours with nine ACAVs and fifty trucks (figure 6).²⁶

While the convoy was departing the staging area, two battalions of a Viet Cong Regiment, reinforced with heavy weapons, were making final preparations at the ambush site. A Viet Cong observer twenty kilometers to the west of the ambush site signaled to the regimental headquarters that the convoy was enroute.

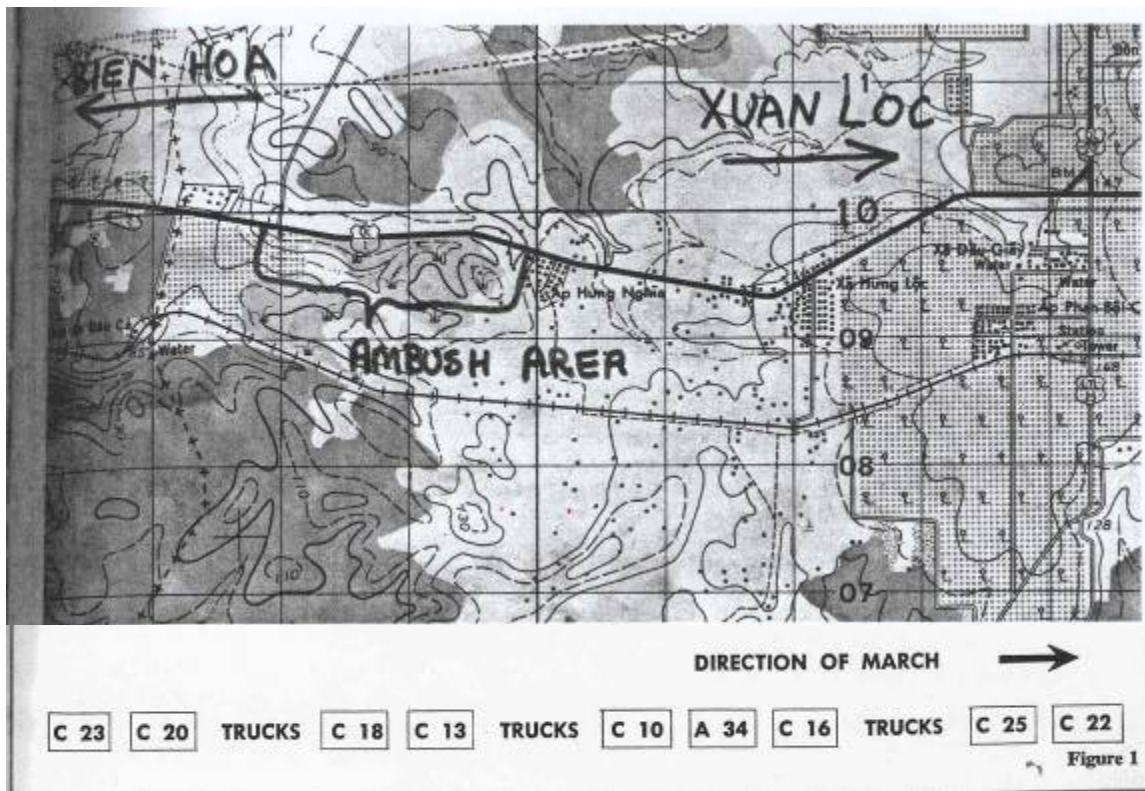


Figure 6. Ambush in Vicinity of Xuan Loc

Source: John F. Votaw, "The Blackhorse Kicks Back," *Armor* 76, no. 4 (July-August 1967): 39.

When the lead elements of the cavalry platoon made contact, the platoon leader ordered the lead element to break through and continue movement. The lead section and the first set of trucks continued, but the rear of the convoy and the C18 and C13 tracks were caught in the kill zone of the ambush. The platoon leader in the C16 track moved to the ambush site to assist the section in the kill zone. At the same time the Squadron commander maneuvered the remainder of C Troop, B Troop, and D Company to the ambush site. The squadron headquarters coordinated fixed wing and rotary wing air assets to provide fire support. The enemy, who was probably aware that reinforcements were moving towards the ambush site, began to withdraw.²⁷ The 1st Squadron elements maintained contact with the enemy and continued to engage. The firepower and protection of the ACAVs, use of combined arms, and superior mobility of the ground troops enabled the squadron to successfully defeat the ambush.

Less than two weeks later, on 2 December 1966, 1st Squadron fought another successful counterambush engagement at Soi Cat (figures 7 and 8). Again, the ambushed platoon fought its way out of the kill zone while the squadron commander maneuvered the other cavalry troops and tank company of the squadron toward the ambush site. The squadron coordinated air strikes and attack helicopter support and immediately maneuvered the squadron's 155-millimeter self-propelled artillery battery to a position where it could range the enemy. After linking up with the platoon near the ambush site, B Troop bounded its way back into the ambush site using the herringbone formation.²⁸ Shortly after B Troop's arrival, the remainder of the troops and the tank company reached the ambush site and began engaging the enemy. An after action review conducted by 1st Squadron, 11 Armored Cavalry Regiment stated:

We of the First of the Blackhorse believe that the defeat to the Viet Cong attack force was a direct result of:

1. Rapid reaction and aggressiveness on the part of the ambushed force and the remaining elements of the squadron.
2. Immediate employment of all available fire support.
3. The vast amount of firepower possessed by the ACAV and the tank.
4. Stateside training on the counter-ambush drill.²⁹

Battlefield police conducted the following day resulted in the discovery of ninety-three enemy killed in action and the capture of numerous heavy machine guns, RPG-2s, assault rifles, a 60-millimeter mortar, and a 75-millimeter recoilless rifle.³⁰ The 2nd Platoon, B Troop had successfully countered an ambush conducted by a reinforced Viet Cong battalion from the 275th Viet Cong Regiment.³¹

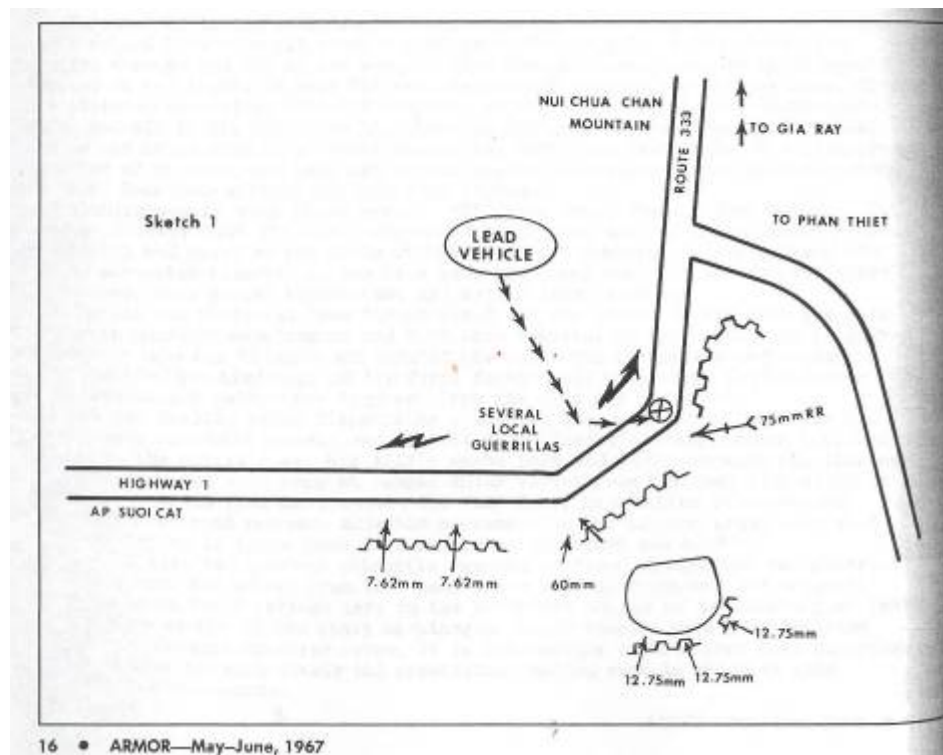


Figure 7. Ambush at Suoi Cat

Source: George L. Gunderman, "Ambush," *Armor* 76, no. 3 (June 1967): 17.

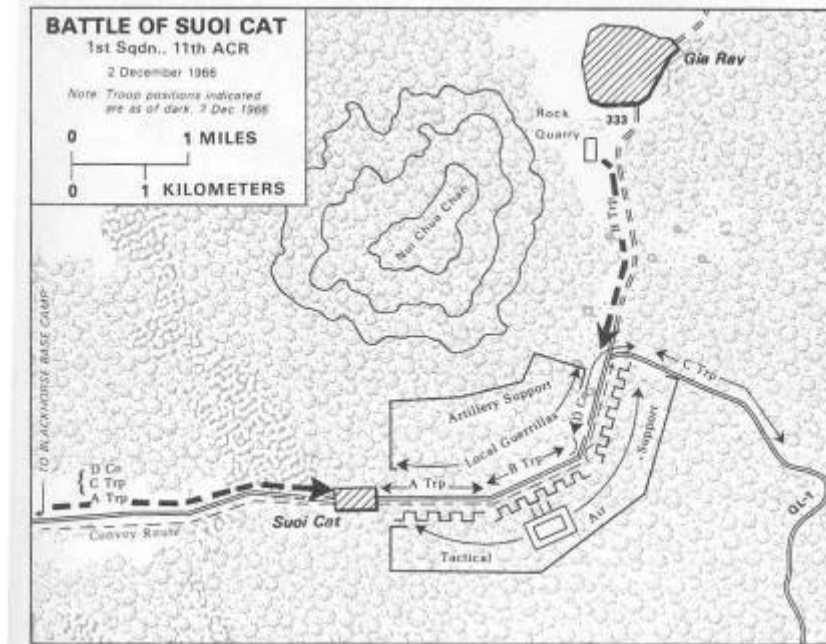


Figure 8. Ambush at Suoi Cat

Source: Starry, 75.

Several tactics, techniques, and procedures were validated during these engagements. The herringbone formation was created as an effective way for armored cavalry to stand and fight from the road until fire superiority could be achieved (see figure 9). This formation allowed all guns to be fired and provided for mutual support between vehicles. The cavalry fundamental of gaining and maintaining contact was equally important in the counterambush.³² After using all available firepower to protect the escorted vehicles and fight out of the kill zone, the cavalry would move back to the ambush site. All available reinforcements were maneuvered to envelop the enemy.³³ Once contact was made, the cavalry would relentlessly pursue the enemy. Indirect fire was used to the maximum extent possible. Although other armored units performed LOC security, the combined arms organization of the cavalry squadron facilitated their success in these operations.

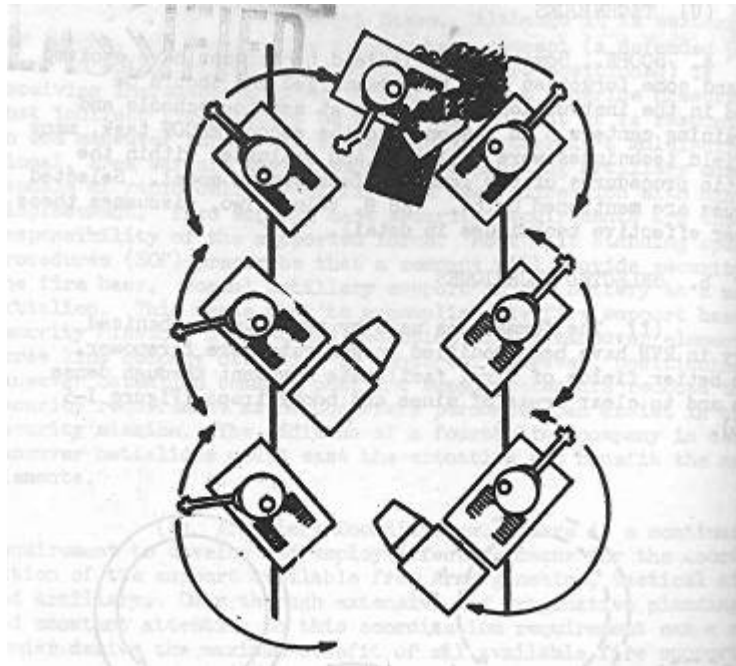


Figure 9. Herringbone Formation

Source: Combat Operations Research Group, *Evaluation of Armor*, vol. 1, I-26.

Not all route security and convoy escort missions were successful. LOC security missions were often boring and tedious which could lead to complacency. A convoy escort conducted by 3rd Squadron, 5th Cavalry, demonstrated how complacency and lack of preparation can lead to failure. The 3rd Squadron tasked C Troop with conducting linkup with a convoy sixty kilometers to the south in order to escort the convoy back to the base camp. The C Troop commander was familiar with the area of operations and felt contact was unlikely. However, no friendly operations had been conducted in the area during the past thirty days. The squadron headquarters was consumed with other operations and did not even brief the squadron commander on the mission. The C Troop commander sent two platoons to execute the convoy escort. The troop commander remained at the base camp with his third platoon. The commander tasked one of the two

escort platoons to establish a strongpoint along the route and remain overnight. He tasked the lead platoon to link up with the convoy and escort it back to base camp the following morning. Neither platoon made it that far.

About nine kilometers south of Blackhorse [base camp], Route 2 crested a slight rise, ran straight south for two kilometers, and then crested another rise. The sides of the road had been cleared out to about 100 meters. As the lead tank started up the southernmost rise at 0410, the last vehicle in the convoy, the mortar carrier, was leveling off on the straight stretch two kilometers behind. Suddenly a rocket propelled grenade round hit the lead tank, killing the driver and stopping the tank in the middle of the road. An ambush then erupted along the entire two-kilometer stretch of road. A hail of grenades quickly set the remaining vehicles of the lead platoon afire; intense small arms fire killed most of the men riding atop the vehicles. As the trailing platoon leader directed his platoon into a herringbone formation, the mortar carrier was hit by a command detonated mine, exploding mortar ammunition and destroying the carrier. The tank with the last platoon was hit by a rocket grenade round, ran off the road, blew up, and burned. The surprise was so complete that no organized fire was returned. When individual vehicles attempted to return fire, the enemy, from positions in a deadfall some fifteen meters off the road, concentrated on that one vehicle until it stopped firing. Within ten minutes the fight was over.³⁴

Their failure to execute a counterambush drill had disastrous consequences. C Troop suffered forty-two casualties, four Armored Cavalry Assault Vehicles (ACAV) and one tank were destroyed, and three ACAVs and one tank were heavily damaged.

The third and primary role for cavalry squadrons was to conduct offensive operations to destroy NVA and VC forces. US ground forces conducted two basic types of offensive missions in Vietnam: clear and secure, and search and destroy. Clear and secure operations required more permanence than a search and destroy and required continuous application of search and destroy techniques in an area of operations.³⁵ Clear and secure operations generally took place in populated areas in order to drive enemy forces away from the civilian population. Once an area was clear, units conducted security of the area to prevent the return of Viet Cong forces.³⁶ Often a search and

destroy mission would precede and set the conditions for a clear and secure operation.

The only significant difference between the search and destroy mission and the clear and secure mission, was the use of a security force to control terrain once the enemy had been destroyed or had displaced. For brevity, this study will focus on the search and destroy mission.

Another offensive mission that was frequently referenced in Vietnam era literature was the cordon and search. However, the cordon and search was simply a technique for executing the clear and secure or the search and destroy and was not an entirely different type of mission. When the North Vietnamese Army and Viet Cong were confronted at a time and place for which they were unprepared to fight, they often evaded US forces and withdrew. In order to prevent the enemy from displacing to avoid contact, the search area was first isolated by establishing blocking positions around the area to be searched. Once the cordon was set, the search and destroy force would maneuver into the search area. The enemy had two choices, remain and fight or displace and possibly make contact with a blocking force.

Opponents of the Vietnam War have often criticized the use of search and destroy operations. The strategy which led to the use of search and destroy was flawed, but not the tactics of search and destroy. General Westmoreland's strategy was to focus on attrition warfare in order to defeat the enemy's ability to wage war in Vietnam. The search and destroy tactic was successful at accomplishing attrition.

Search and destroy operations, by any name, were the tactics by which U.S. units engaged the enemy. They were the right operations at the time, and they contributed to the essential function of shielding the pacification effort from the enemy's main forces.³⁷

The search and destroy was a term that entered the military's lexicon during the Vietnam War, but the term became unpopular with the public.

U.S. command recognized that the term "search and destroy" had unfortunately become associated with "aimless searches in the jungle and the destruction of property."³⁸

The negative connotation of search and destroy resulted in the elimination of its use as a term, although the army continued to use this tactic. In April 1968, General Westmoreland directed the use of the search and destroy term be discontinued. Subsequent operations were renamed in terms which described the type of operation, for example, reconnaissance in force.³⁹

The search and destroy was the equivalent of search and attack operations in contemporary doctrine. The search and destroy was a form of movement to contact and was also similar to reconnaissance in force. US ground forces used the search and destroy when the enemy was dispersed in restrictive terrain and his precise location was unknown, which was the norm in Vietnam. The purpose of a search and destroy was to destroy the enemy, deny him use of an area, and to gather intelligence. Typically, search and destroy operations were conducted at the battalion or brigade level, but every echelon of the army from platoon level to corps executed search and destroy operation.

Search and destroy was the primary type of offensive operation used by US ground forces in Vietnam and was the major type of offensive operations that armored cavalry squadrons were employed in. The *Evaluation of Armor Operations* concluded that 96 percent of all significant operations initiated by friendly action were search and destroy missions in 1966.⁴⁰ Division commanders in Corps Tactical Zones II and III stated the majority of missions conducted from 1967 to 1968 was search and destroy

operations.⁴¹ An analysis of II and III Corps Tactical Zones in 1966 revealed that armored cavalry squadron missions were 33 percent search and destroy, 16 percent clear and secure, and 51 percent security (figures 10 and 11). Troops attached to infantry battalions participated in an even greater percentage of search and destroy operations. As commanders became more comfortable using squadrons in a maneuver battalion role, the use of armored squadrons in search and destroy operations increased. Although the name changed after 1968, the search and destroy remained the primary offensive operation conducted by US forces throughout the Vietnam War.

If a flaw in existed search and destroy tactics, it was the surrendering of initiative by allowing the enemy to choose the place, ground and time that engagements were fought. The enemy could set booby-traps, mines, and emplace ambushes to attrit search and destroy forces. By forcing the Americans into close combat, the enemy also mitigated the US forces' ability to call in air strikes or artillery. The use of armored units in search and destroy operations countered some of the advantage held by the enemy. Unlike the infantry, armored units could smash through the jungle, setting off the anti-personnel mines and booby-traps without injury, and gain and maintain contact with the enemy without taking heavy casualties.

Armored search and destroy missions were executed with three basic phases. First, the area of operations was isolated through the use of ground troops to cordon the area, or through the use of indirect fires. Second, the ACAVs and tanks of the cavalry conducted a search of the objective area. Finally, infantry troops conducted a deliberate and detailed clearing of the area.

UNIT (IN-COUNTRY) ^{a/}	SEARCH AND DESTROY	CLEAR AND SECURE	SECURITY	TRAINING, CARE AND MAINTENANCE
11 ACR (Oct-Jan)	133	9	219	5
1/4 Cav (Jul-Jan)	73	39	91	11
3/4 Cav (Jul-Jan)	46	78	85	3
1/5 Mech (Jul-Jan)	162	8	27	16
2/34 Armor (Oct-Jan)	58	3	57	4
2/22 Mech (Nov-Jan)	55	6	31	-
^{a/} 2/2, 4/23, 5/60, not shown due to the late conversion or arrival date.				

Figure 10. Missions Conducted in II CTZ in 1966 Using Armor and Mechanized Units, by Battalion Days.

Source: Combat Operations Research Group, *Evaluation of Armor*, vol. 3, III-50

UNIT (IN-COUNTRY)	SEARCH AND DESTROY	CLEAR AND SECURE	SECURITY
A/2/17 Cav (Jul-Jan) ^{a/}	92	67	54
C/3/4 Cav (Aug-Jan) ^{a/}	177	-	-
1/69 Armor (Aug-Jan)	177	-	-
1/10 Cav (Oct-Jan)	106	-	-
(1/9 Cav not included)			
^{a/} As reported from I FFV, shown in company days.			

Figure 11. Missions Conducted in II CTZ in 1966 Using Armor and Mechanized Units, by Battalion Days.

Source: Combat Operations Research Group, *Evaluation of Armor*, vol. 3, III-51.

In a significant change to doctrine, armored forces frequently led the infantry in Vietnam during the search and destroy. The armored vehicles cleared lanes through the jungle setting off mines and booby traps ahead of the infantry. Prior to Vietnam, the doctrine and standard tactics required infantry to lead armored forces in restrictive terrain. “Contrary to doctrine, tanks lead the infantry in dense jungles in order to detonate antipersonnel mines and clear fields of fire with canister munitions or by crushing the foliage.”⁴² Infantry forces followed to clear behind the armored units. In another reversal of tactics, armor cavalry units were not always used as the enveloping force. Historically, slower infantry forces fixed the enemy while cavalry forces conducted envelopment. With the proliferation of helicopters and their inherent speed, armored forces were used to bring pressure against an elusive enemy with infantry being air-inserted to envelop.⁴³

Armored troops developed several techniques for searches. Depending on the situation, a line formation, inverted wedge, or cloverleaf formation was employed to search the area (figures 12 and 13). The cloverleaf formation permitted a rapid search of a large area without the use of a reserve. When a platoon made contact with the enemy, the commander maneuvered forces not in contact to engage the enemy. This technique did not assure complete coverage of an area, but it did allow the discovery of emplacements or installations of sufficient size to be considered important.⁴⁴ The specific technique chosen was the result of the specific tactical situations.

The largest and probably the most famous search and destroy operation conducted during the Vietnam War was Operation Junction City. Junction City took place from 22 February to 14 May 1967 in the III Corps Tactical Zone. The operations had three major

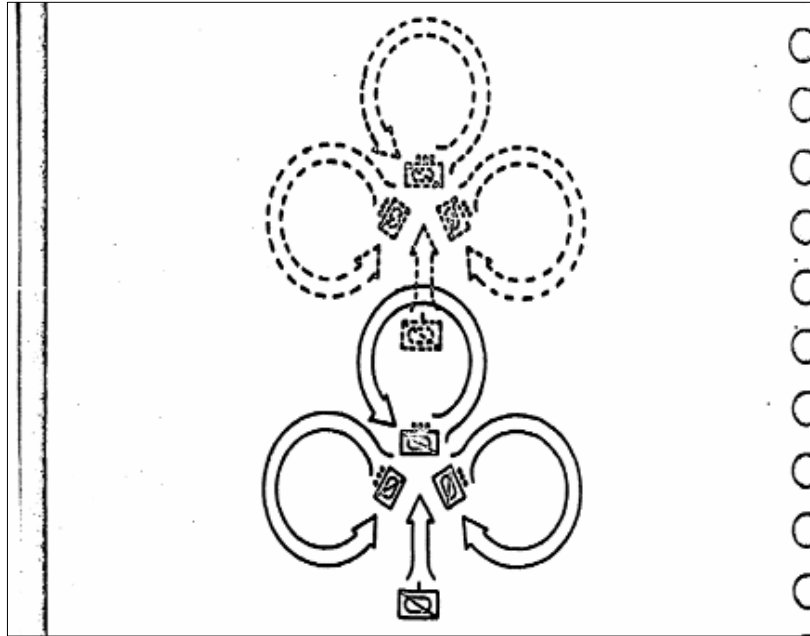


Figure 12. Diagram of an Armored Cavalry Troop Using the Cloverleaf Technique to Conduct Search and Destroy Operations
 Source: Combat Operations Research Group, *Evaluation of Armor*, vol. 1, I-25.

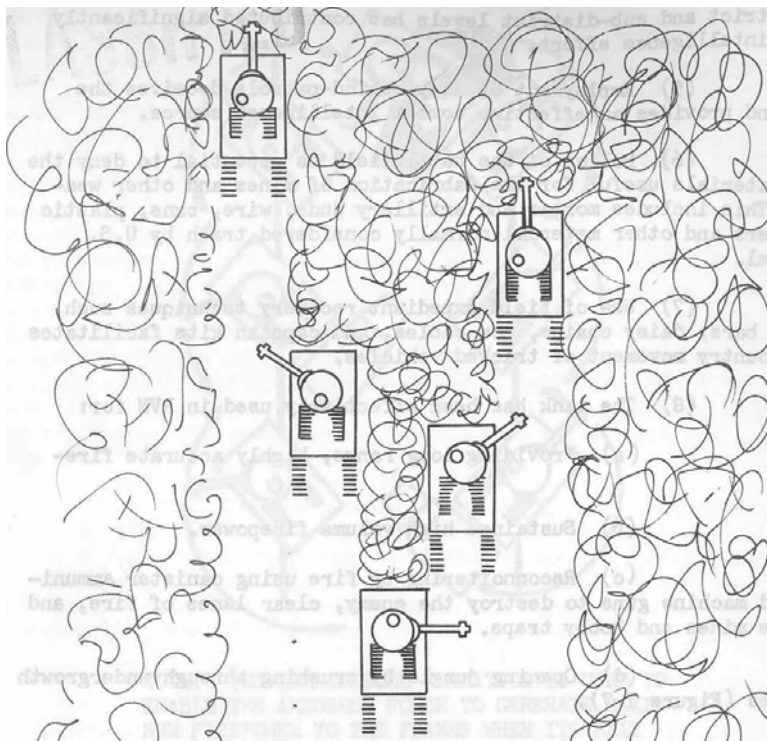


Figure 13. Inverse Wedge Formation to Clear Brush and Fields of Fire

Source: Combat Operations Research Group, *Evaluation of Armor*, vol. 1, I-28.
objectives: to engage the 9th Viet Cong Division and the 101st North Vietnamese Army Regiment, to destroy the Central Office of South Vietnam (COSV) headquarters, and to destroy enemy base camps and installations in the area of operations.⁴⁵

Junction City was a corps-level operation that included two reinforced US infantry divisions. The operation began with five brigades establishing blocking positions to prevent the enemy from displacing to safe havens in Cambodia. The cordon included the use of airborne and airmobile troops. After the horseshoe was set, elements of the 11th Armored Cavalry Regiment and the 2d Brigade of the 25th Division attacked northward through the open end of the horseshoe to engage Viet Cong and locate and destroy COSVN and NVA-VC installations. After completing the search and destroy within the horseshoe, the 11th Armored Cavalry Regiment continued search and destroy operations along the Cambodian border in 25th Infantry Division's area of operations (figure 14).

The operation was a partial success. While the 11th Armored Cavalry Regiment and the 2nd Brigade, 25th Infantry Division were unable to decisively engage the 9th Viet Cong division, they did locate and destroy key infrastructure of the enemy's headquarters.

Captured documents confirmed-that the operation was essentially an enemy "disaster." According to these knowledgeable defectors, the loss of major base areas and the resulting deterioration of local forces in III Corps forced the enemy high command to make basic revisions in tactics. JUNCTION CITY convinced the enemy command that continuing to base main force units in close proximity to the key population areas would be increasingly foolhardy. From that time on the enemy made increasing use of Cambodian sanctuaries for his bases, hospitals, training centers, and supply depots.⁴⁶

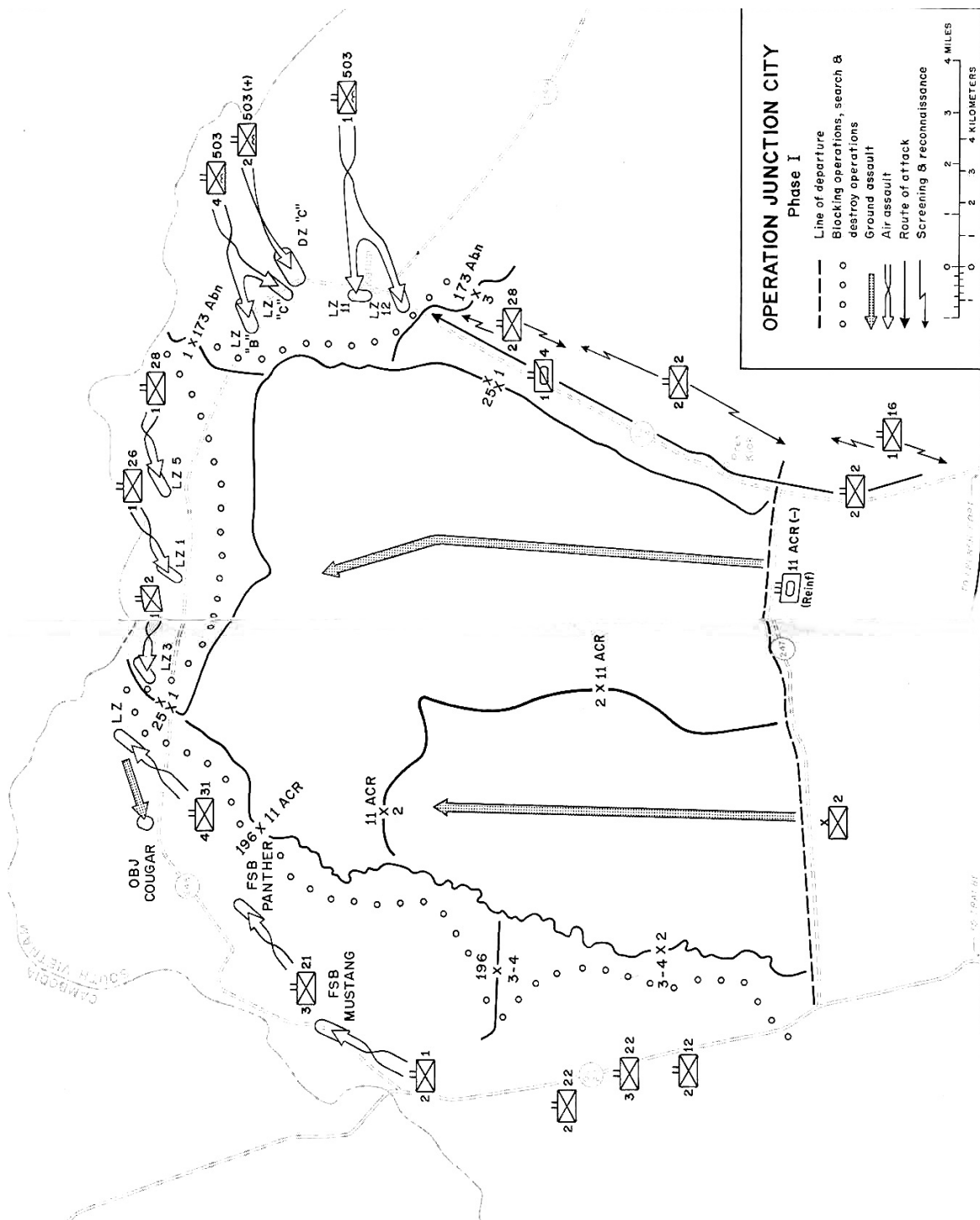


Figure 14. Operation Junction City

Source: Lieutenant General Bernard W. Rogers, *Cedar Falls-Junction City: A Turning Point* (Washington, DC: Center for Military History, 1974), 98

Unfortunately, a majority of Viet Cong forces escaped to Cambodia. In a classic example of a combined arms search and destroy operation, airmobile and airborne infantry rapidly enveloped and established a cordon followed by search operations led by cavalry forces.

Another example of cavalry forces conducting search and destroy operations in Vietnam was at the battle of Binh An in I Corps Tactical Zone (figure 15). The battle of Binh An was fought by the 3rd Squadron, 5th Cavalry reinforced by two infantry companies and one light cavalry troop⁴⁷ of the 1st Cavalry Division on June 27, 1968. The battle was an excellent example of the inherent flexibility, firepower, protection, and mobility of the armored cavalry squadron. Although the squadron called the mission a reconnaissance operation, the battle of Binh An had the characteristics of a search and destroy mission. C Troop, 3rd Squadron, 5th Cavalry and D Troop, 1st Squadron, 9th Cavalry were conducting a reconnaissance in force when they received small arms and RPG fire. The squadron rapidly maneuvered A Troop and B Troop and airlifted two infantry companies to establish a cordon of the Binh An. The superior mobility of the cavalry enabled them to reinforce any part of the cordon as quickly as an attack of breakout proportions was mounted. Just prior to darkness, B Troop assaulted Bin An and repeatedly passed through the area to neutralize enemy resistance. The next day the squadron conducted a detailed search of the area. Throughout the operations the squadron used close air support, artillery, and mortars to pound the area. The operation resulted in the destruction of the 814th NVA Battalion.⁴⁸ In a classic cavalry form, the squadron gained and maintained contact, developed the situation, and “piled on” the enemy.

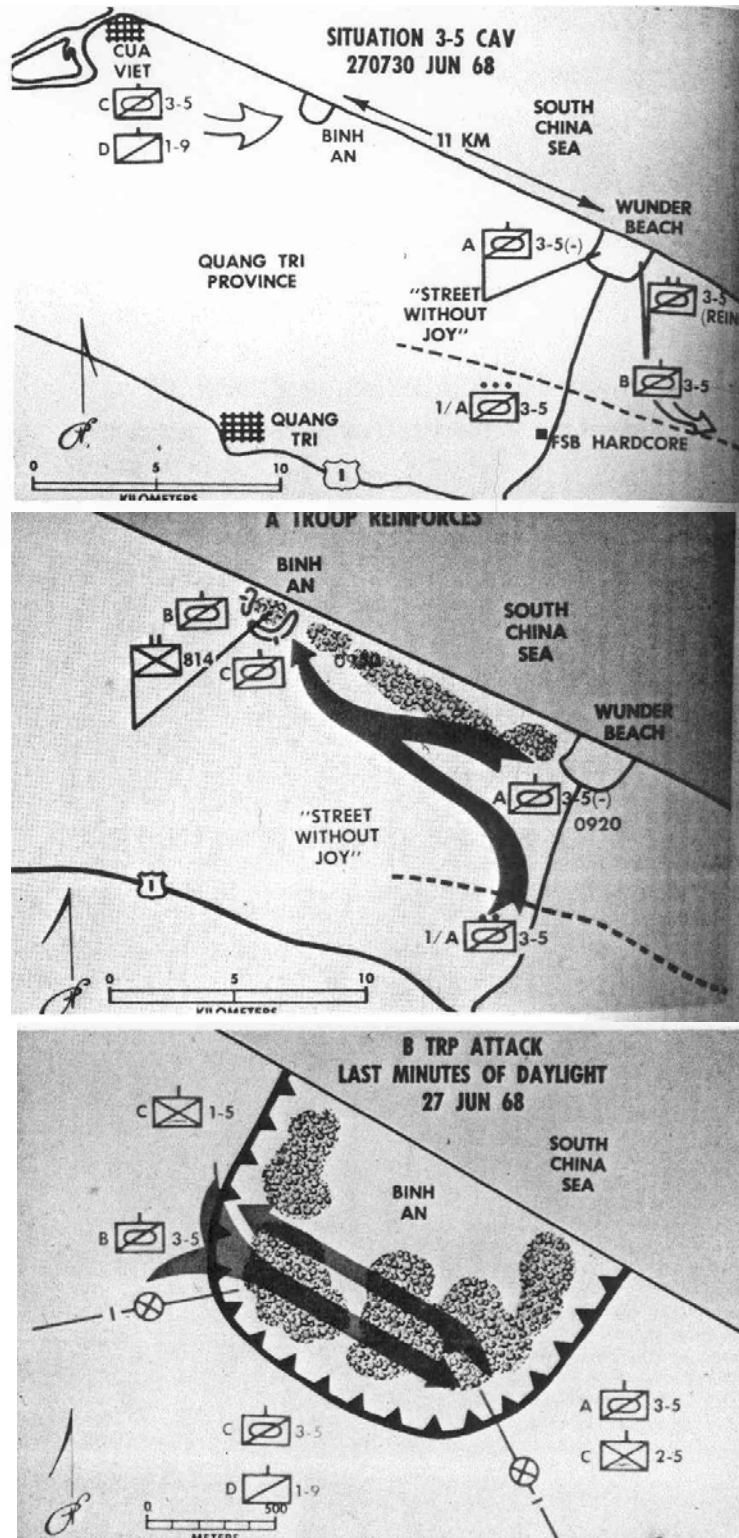


Figure 15. Battle of Binh An

Source: Ralph B. Garretson Jr., "The Battle of Binh An," *Armor* 78, no. 4 (July-August 1969): 27.

“Pile on” was a phrase adopted by the 11th Armored Cavalry to denote the overall tactics and philosophy for the 11th Armored Cavalry Regiment. Essentially, the pile on tactic meant that the force which initially gains contact will maintain contact using its armored protected firepower to “hang on” to the enemy. The squadron commander would then throw all available assets into the engagement. According to Colonel George S. Patton, the 11th Armored Cavalry Regiment Commander,

You must act now by literally throwing force together from all directions in order to first encircle or fix, then compress, and finally destroy the enemy. . . . The best rule to remember is that any unit not in contact is in reserve.⁴⁹

The pile on tactic applied to every mission performed by the regiment, whether it was base camp security or a search and destroy operation. The underlying idea was to exploit every contact and to never allow the enemy to withdraw without attempting to decisively defeat him. The pile on tactic relied upon the rapid mobility and overwhelming combined arms firepower of the cavalry squadron.

The armored cavalry clearly excelled in an environment and against an enemy for which they were not supposed to be successful. When executed properly, armored cavalry squadrons established they could execute perimeter security, LOC security, and search and destroy operations as well as, if not better than infantry, mechanized infantry, or tank battalions. Key to success was their mobility, firepower, and protection. Their rapid mobility allowed them to quickly mass troops and pile on when required. The *Evaluation of Armor Operations* report concluded that the cavalry could respond quicker to events on the battlefield than other organizations (figure 16). Their protection and firepower enabled small units to maintain contact without being overwhelmed until pile

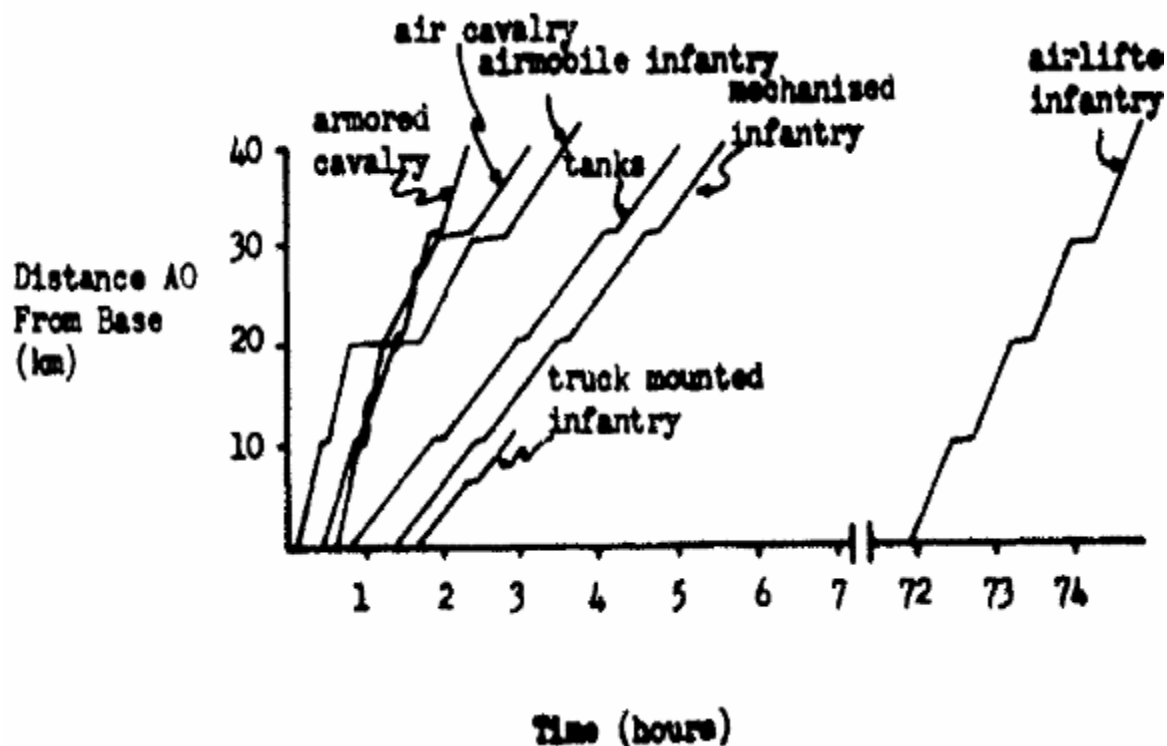


Figure 16. Force Generation Capability of Type of Maneuver Battalion as a Function of Time and Distance of an Area of Operation from Base.

Source: Combat Operations Research Group, *Evaluation of Armor*, vol. 3, III-27.

on forces arrive. The armored cavalry characteristics of flexibility, mobility, protection, and firepower which made the cavalry an asset on the conventional battlefield also contributed to their success in area warfare.

The Armored Cavalry was not unique in their ability to execute the missions of perimeter security, LOC security, or search and destroy operations. Other mechanized infantry and armor task forces could execute these operations as well. One advantage that the cavalry had over other armored forces in Vietnam was their combined arms task organization down to the platoon level. The combined arms task organization of the

cavalry enhanced their capabilities. This task organization was not thrust upon them in theater or after deploying, it was integral part of their training and doctrine.

One of the obvious reasons for the indicated preference of armored cavalry in this study is the fact that it is a ready-made combined arms team, including all elements of the ground team, and more air capability as well. This fact indicates not necessarily a requirement for more armored cavalry, although some is indicated, but the requirement for more careful tailoring of task organizations at all echelons of command to field a balanced combined arms team designed for the mission – enemy – terrain and weather – with troops available.⁵⁰

The Army did not require more cavalry forces necessarily; the army required appropriately task organized forces for area warfare combat.

¹Donn A. Starry, *Armored Combat in Vietnam* (United States: Arno Press, 1980), 65.

²Department of the Army, Field Manual 17-95, *The Armored Cavalry Regiment* (Washington, DC: Department of the Army, 1966), 1.

³Department of the Army, Field Manual 17-1, *Armor Operations* (Washington, DC: Department of the Army, 1966), 5.

⁴Raymond R. Battreall Jr., "Cavalry Operations: Reconnaissance," *Armor* 78, no. 2 (March - April 1969): 39.

⁵Raymond R. Battreall Jr., "Armor in Vietnam," *Armor* 75, no. 3 (June 1966): 4-8, 8.

⁶FM 17-95.

⁷Department of the Army, Field Manual 1-02, *Operational Terms and Graphics* (Washington, DC: Department of the Army, 2004), 1-67.

⁸Combat Operations Research Group, *Evaluation of U.S. Army Mechanized and Armor Combat Operations in Vietnam*, vol. 1: *Basic Report* (Washington, DC: Department of the Army, 1967): I-70.

⁹Starry, 164.

¹⁰*Ibid.*, 165.

¹¹Starry, 57.

¹²Simon Dunstan, *Vietnam Tracks: Armor in Battle, 1945-1975* (Novato, CA: Presidio Press, 1982), 63.

¹³Starry, 57.

¹⁴John H. Hay, *Vietnam Studies: Tactical and Material Innovation* (Washington, DC: Center for Military History, 1989), 97.

¹⁵Dunstan, 92.

¹⁶A laager site was a temporary perimeter, typically less than 24 hours, set up by mechanized forces to conduct resupply and maintenance operations.

¹⁷Stand-to was the term used by the Army to indicate a full level of readiness within a defensive position or assembly area. Stand-to normally was normally conducted just before sunrise, which was the time of day when the enemy frequently initiated attacks.

¹⁸Dunstan, 92.

¹⁹Starry, 62-63.

²⁰*Ibid.*, 72.

²¹Dunstan, 84.

²²*Ibid.*, 86.

²³Starry, 107.

²⁴*Ibid.*

²⁵*Ibid.*

²⁶John F. Votaw, "The Blackhorse Kicks Back," *Armor* 76, no. 4 (July-August 1967): 38-41.

²⁷*Ibid.*

²⁸The herringbone formation was used to allow the ambushed force to maximize firepower to its flanks when its exit from the ambush area was blocked. Combat vehicles would close rapidly within a few feet of each other, alternating orientation to either side of the road to maintain 360-degree security. In this instance, the platoon bounded forward using the herringbone formation.

²⁹George L. Gunderman, "Ambush," *Armor* 76, no. 3 (May-June 1967): 19.

³⁰*Ibid.*

- ³¹Ibid., 17; and Starry, 78.
- ³²Gunderman, 17.
- ³³Starry, 75.
- ³⁴Ibid., 109.
- ³⁵Combat Operations Research Group, *Evaluation of U.S. Army Mechanized and Armor Combat Operations in Vietnam*, vol. 3: *Combat Capabilities* (Washington, DC: Department of the Army, 1967): III-70.
- ³⁶Hay, 127.
- ³⁷Ibid., 178.
- ³⁸Ibid., 177.
- ³⁹Dunstan, 72.
- ⁴⁰*Evaluation of Armor Operations*, vol. 3, 35-37.
- ⁴¹Based on estimates by the division commanders. *Evaluation of Armor Operations*, vol. 1, I-F-6.
- ⁴²Ibid., I-B-9.
- ⁴³Arthur L. West and Donn A. Starry, "Armor in Area War," *Armor* 77, no. 5 (September – October 1968): 36.
- ⁴⁴Combat Operations Research Group, *Evaluation of U.S. Army Mechanized and Armor Combat Operations in Vietnam: Summary* (Washington, DC: Department of the Army, 1967): 133.
- ⁴⁵Lieutenant General Bernard W. Rogers, *Cedar Falls-Junction City: A Turning Point* (Washington, DC: Center for Military History, 1974), 85.
- ⁴⁶Ibid., 153.
- ⁴⁷A light cavalry troop consisted of scouts platoons equipped with jeeps and no mechanized vehicles.
- ⁴⁸William W. Cobb, "Mounted Combat Operations in Vietnam," *Armor* 78, no. 4 (August 1969): 28.
- ⁴⁹George S. Patton, "Blackhorse Operations," *Armor* 78, no. 4 (July-August 1969): 37.

⁵⁰ *Evaluation of Armor Operations*, vol. 3, III-40.

CHAPTER 3

CAVALRY EQUIPMENT

As you know, you have to go to war with the Army you have, not the Army you want.¹

Secretary of Defense Donald H. Rumsfeld

A simple analysis would suggest the US Army armored forces were not properly equipped and therefore unprepared for war in Vietnam. However, in 1965 the largest threat to US security was a Soviet invasion in the Europe and developing armored vehicles to fight in a nonlinear, restrictive environment was not a priority for the Army. Armored vehicles were designed to maximize front slope armor and engage at standoff ranges. In contrast, Vietnam required protection from all sides and engagements were at close ranges. Many geographic areas in Vietnam did not support the weight of a heavy tank, whereas the European terrain and advanced infrastructure could. Combat vehicles that were unsuited for combat in Vietnam were replaced with better systems and others were modified to provide the cavalry with effective vehicles for the cavalry mission in Vietnam.

Since the introduction of mechanized vehicles to warfare, the US Army has generally failed to develop a successful armored reconnaissance vehicle. They have often been too much like battle tanks with limited range and mobility or too light to survive on the battlefield. The cavalry's lack of branch status equal to infantry or armor added to the equipping problem. As a result, the Army placed less emphasis and resources on developing combat vehicles designed specifically for use by the cavalry. Cavalry forces

were often equipped with vehicles developed for armor and infantry units and modified for use by the cavalry.

The terrain and enemy complicated the type of combat vehicle needed for Vietnam. The vast number of water obstacles and soft terrain in the delta and coastal region inhibited the movement of heavily armored vehicles off road and many poorly constructed bridges were incapable of carrying the weight of medium tanks. The enemy's effective use of new, hand-held rocket propelled grenades (RPG), recoilless rifles, and randomly placed mines increased the need for all around armor protection for crew survivability. Lighter vehicles also had difficulty traversing the heavily forested terrain of the central highlands and piedmont regions. The cavalry required vehicles that were light enough to negotiate paddies and water obstacles, powerful enough to crash through jungles, and with sufficient armor protection to counter the enemy's anti-armor weapons.

The challenge of equipping modern cavalry units was not unique to the Vietnam War. Before and after the Vietnam War, the cavalry strove to select equipment that balanced stealth and mobility with sufficient protection and firepower. Equipment that was too heavy inhibited independent operations and stealthy, long-range reconnaissance, but equipment that was too light typically lacked the armor protection required for survivability or the firepower required for shock effect. Following World War II, the trend in the US cavalry was toward lighter vehicles with extended range and mobility. In the early 1960s, the US Army began to increase the firepower and protection of cavalry units by equipping armored cavalry squadrons with armored reconnaissance vehicles and medium battle tanks.

In 1965, when America began sending troops to Vietnam, the *M114* Command and Reconnaissance Carrier (figure 17) was the primary reconnaissance vehicle of the armored cavalry. US cavalry troopers were enthusiastic about the M114 they fielded in 1963. The M114 replaced the one-quarter ton truck² as the reconnaissance vehicle of the armored cavalry platoon and had significant advantages over the one-quarter ton truck, which lacked armor protection, cross-country mobility, and fire power. At the time, US cavalrymen thought the M114 answered the need for an armored reconnaissance vehicle.³



Figure 17. M114 Command and Reconnaissance Carrier

Source: Christopher F. Foss, *Janes's World Armoured Fighting Vehicles* (New York, NY: St. Martins Press, 1976), 182.

On paper, the M114 appeared to be an excellent choice for armored reconnaissance. First, the M114's size and light weight enhanced its mobility. With a height of less than eight feet, a width of only seven feet eight inches, and a turning radius of nine feet, the M114 could fit and move in confined spaces. A combat loaded weight of

only fifteen thousand pounds gave the M114 a low ground pressure that theoretically should have enhanced its cross country mobility in soft, muddy terrain. The M114 was also amphibious without extensive preparation. It was powered by a gasoline V8 engine capable of achieving road speeds of 58 kilometers per hour.⁴ Second, the M114 provided protection and firepower to the scout. The M114 mounted two crew served machine guns. On the upgraded M114A1 version, the vehicle commander could remotely fire his .50-caliber machine gun from inside the vehicle while the observer operated a M60 7.62-millimeter machine gun from his position behind the commander. The hull of the M114 consisted of all-welded aluminum armor providing protection from small arms and indirect fire. In addition to a three man crew consisting of a driver, commander, and observer, the M114 carried a fourth passenger or scout for enhanced reconnaissance and security.⁵ In theory, the M114 was a capable reconnaissance vehicle and the Army intended to deploy it to Vietnam.

In reality, the M114 performed poorly in Vietnam when tested in combat by the Army of the Republic of Vietnam (ARVN). Beginning in 1963, the Army Concept Team in Vietnam conducted a year long evaluation of the eighty M114s provided to ARVN armored cavalry reconnaissance squadrons.⁶ The Concept Team discovered several problems with the M114's mobility. Although the M114 was amphibious, it had difficulty entering and exiting waterways with embankments. The nose of the M114 extended beyond the tracks inhibiting the M114 from climbing steep slopes. Secondly, the gasoline engine of the M114 did not provide sufficient power to traverse cross country and was mechanically unreliable.⁷ The Concept Team also found the M114

armor failed to provide adequate crew survivability; even a moderate size mine would literally blow the M114 apart.⁸

Field testing in Vietnam proved that the M114 did not have the required mobility and protection for armored scouts. The ARVN replaced the ill-performing M114 with the M113 armored personnel carrier in November 1964. Based on the ARVN experience, the US Army chose to not deploy M114 to Vietnam with US cavalry squadrons.

Despite the M114's poor performance in Vietnam, the US Army continued to equip armored cavalry units in Europe and the US with the M114. In 1973, General Creighton Abrams, Chief of Staff of the Army, cancelled production of the M114.⁹ The Army gradually phased the M114 out of existence until the Army replaced the last M114 in 1980.¹⁰ The M114 was the last reconnaissance vehicle specifically developed and produced for US armored cavalry units in the 20th Century.

The experience of the ARVN was instrumental for the selection of vehicles used by the US cavalry. American advisors to ARVN armored and mechanized units learned a great deal from operating with the ARVN. One of the most important discoveries was the utility of the M113 armored personnel carrier. After its introduction in 1962, the M113 armored personnel carrier quickly became a workhorse of the ARVN. The ARVN soldiers and US advisors quickly realized that the M113 had uses beyond that of a troop transport vehicle. The ARVN's success with the M113 swayed the US Army to replace the M114 with the M113 in armored cavalry squadrons deploying to Vietnam.

Since it entered service in 1960, the M113 has been an indispensable asset. Although the M113 was originally designed to only be a troop transport vehicle, the Army expanded its roles and functions. Since its introduction, the Army has produced

several upgrades and numerous variants based on the M113 chassis including mortar carriers, command posts, air defense vehicles, recovery vehicles, fire support vehicles, and antitank variants. Over a dozen variations of the M113 are still in service with the US Army forty-five years after the US Army accepted the first M113. The M113's adaptation and long service in the Army started with its success on the battlefield in Vietnam.

The first upgrade to the M113, re-designated the M113A1, was the replacement of the M113's gasoline engine with a diesel engine in 1964. The diesel engine increased horsepower and decreased the risk of secondary explosions caused by gasoline. Starting in 1967, all remaining M113s were replaced with M113A1 models. The US Army Vietnam upgraded all M113s to the M113A1 model by 1 July 1968. Other than the added power and safety of the diesel engine, the M113 and M113A1 were nearly identical in capability. Future reference to the armored personnel carrier (APC) or M113 in this study refers to both the M113A1 and M113 (figure 18).

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Figure 18. M113 Armored Personnel Carrier
Source: Michael Green and Peter Sarson, *Armor of the Vietnam War* (Hong Kong: Concord Publications, 1996), 34.

The M113 armored personnel carrier proved to be a capable armored vehicle in Vietnam. The M113 armored personnel carrier carried eleven infantry soldiers plus the vehicle commander and driver. When not used as an infantry carrier, the increased space allowed crews to carry additional ammo. It had a .50-caliber machine gun mounted for firepower and a rolled aluminum hull for protection. The M113 had thicker armor than the M114, making it more survivable to mine strikes and anti-armor fire. Many of the ARVN M113s took multiple hits and continued to fight. On average, it took seven hits with anti-armor weapons to destroy an ARVN M113.¹¹ The watertight construction of the M113 allowed it to swim without extensive preparation.¹² Unlike the M114, the M113 could negotiate embankments when entering and exiting water obstacles. The diesel engine of the M113 gave the eleven-ton vehicle sufficient power to move cross-country in Vietnam.

The AVRN expanded the role of the M113 beyond its intended use as an armored personnel carrier. The AVRN troops discovered that the mobility, protection, and firepower of the M113 gave them an advantage over the lightly armed and less mobile dismounted Viet Cong troops. Dismounting from the M113 prior to closing on a Viet Cong position took away the AVRN's advantage over the enemy and resulted in a loss of momentum. Going against the advice of US advisors, the AVRN chose to remain mounted whenever feasible. The AVRN began to use their M113's in a tank-like role.

There were numerous instances in which the Vietnamese armor units used M113's more as tanks than as armored personnel carriers. The troops that did this usually manned the M113's with fewer than a normal crew, usually 5 to 7 men instead of 12 and would carry much more than a normal basic load of ammunition. With this arrangement, there were no riflemen to dismount and fight and the M113 became a fighting vehicle.¹³

The tactic of using M113's in a tank-like role was later adopted by US cavalry units. The combat experiences of the ARVN led to the creation of an assault version of the M113. At the battle of Ap Bac I in January 1963, the AVRN lost fourteen M113 gunners.¹⁴ After the battle of Ap Bac I, the AVRN began locally fabricating gun shields from available materials to protect gunners. The AVRN also began mounting additional machine guns on the sides of the M113. By late 1963, it was common to see M113s with side-mounted machine guns with gun shields.¹⁵ The US advisors with the AVRN units subsequently recommended these changes to American units who were preparing for deployment. These changes became the basis for the Armored Cavalry Assault Vehicle (ACAV) developed by the US cavalry.

The term Armored Cavalry Assault Vehicle originated with the troopers of the 11th Armored Cavalry Regiment.¹⁶ When the 11th Armored Cavalry Regiment began preparations for deployment to Vietnam in 1966, they replaced their M114s, jeeps, and tanks located in the reconnaissance platoons with M113s.¹⁷ Following the recommendation from AVRN advisors, the 11th Armored Cavalry Regiment modified their M113s with a new gun shield kit designed and built by the Food Machine Corporation (FMC). The FMC "A" kit consisted of hatch armor, a shield for the commander's .50-caliber machine gun, two elbow pintle mounts with gun shields for mounting M60 machine guns on both sides of the M113, and a removable pintle mount on the rear as an alternate mount for one of the M60s.¹⁸ The FMC kit was an improvement over the kits produced in theater which did not offer 360-degree protection of the gunner. Most of the cavalry M113s in Vietnam were modified with the FMC kits

to make them an ACAV (figures 19 and 20). The US Army adopted the unofficial ACAV term to convey the new capability and function of the M113.



Figure 19. Armored Cavalry Assault Vehicle (ACAV) with Trim Vane Up

Source: John Albright, John A. Cash, and Allan W. Sandstrum, *Seven Firefights in Vietnam* (Washington, DC: U.S. Government Printing Office, 1985), 42.

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Figure 20. Armored Cavalry Assault Vehicle (ACAV)

Source: Green and Sarson, 31.

The FMC kit was not the only modification made to the ACAVs fighting in Vietnam. Crews and units performed numerous modifications to improve the protection of the ACAV. The most typical crew modification was layering sandbags on the floor to improve survivability during a mine strike. This added weight frequently led to mechanical breakdowns. Later, the US Army Vietnam initiated the installation of a titanium belly-armor kit beneath the driver and squad compartments of the M113.¹⁹ Crews also added material to the outside to improve protection against RPGs. Field expedient methods used by crews included the use of ammo cans filled with dirt, spare track, sandbags, and steel airfield matting hung on the ACAV. These modifications improved ACAV crew survivability and gave crews more confidence in their vehicle.

In addition to protective measures, crews added weapons to increase the firepower of their ACAVs. A mixture of crew-served weapons was used in lieu of or in addition to the standard weapons of the ACAV. Crews added additional M60s, replaced the .50-caliber machine gun with a 7.62-millimeter minigun or 40-millimeter grenade launcher, or replaced the M60 machine guns with .50-caliber machine guns. Crews also mounted 75-millimeter, 90-millimeter, and 106-millimeter recoilless rifles on top of their ACAVs.²⁰ Claymore mines were mounted on the sides of ACAVs to counterambushes.²¹ Even without any additions, the standard three crew served weapons of the ACAV provided formidable firepower.

The ACAV turned out to be an unlikely success story of the Vietnam War. Although the ACAV had weaknesses such as the lack of heavy armor protection and lack of the shock effect from a tank main gun, its mobility in Vietnam made up for its

weaknesses. The ACAV was an excellent compromise between protection, firepower, and mobility. The ACAV also benefited from the enemy's lack of armor, heavy artillery, or close air support. The ACAV proved superior against an enemy that was less mobile, less protected, and relied on man-portable anti-armor weapons. Based on its versatility and performance in Vietnam, the ACAV was the most successful combat vehicle used by the US cavalry during the Vietnam War.

The primary tank used by US cavalry squadrons during the Vietnam War was the medium battle tank, M48A3 Patton (figures 21 and 22). The Army began producing the M48A3 in 1963. Division cavalry squadrons had M48A3 tanks assigned to the scout platoons and regimental cavalry squadrons had M48A3 tanks assigned to their tank companies. Although some M48A2 Patton tanks did see service with US cavalry squadrons in Vietnam, an overwhelming majority were the M48A3 model. The main difference between the M48A2 and the M48A3 models was the engine. The M48A3 was powered by a diesel engine compared to a gasoline engine in the M48A2. The M60 main battle tank was available, but the priority of issue for the M60 tank was the European theater.

The armament and protection provided by the M48A3 was sufficient against the threat in Vietnam. The M48 armament included a 90-millimeter main gun, a 7.62-millimeter coaxial-mounted machine gun, and a .50-caliber machinegun mounted in the commander's cupola. The firepower of the 90-millimeter main was a key advantage of the tank. "The main purpose of the tank in Vietnam [was] to provide large caliber antipersonnel gunpower."²² The firepower of the 90-millimeter gun was enhanced by the use of canister and beehive rounds, the most effective antipersonnel rounds carried on the

M48A3. The M48 could also carry high explosive antitank (HEAT) and high explosive (HE) rounds, but the utility of these rounds was limited by the lack of fields of fire and short engagement ranges. The M48A3 could also fire White Phosphorus (WP) rounds, but these were also rarely used. The heavy armor afforded the crews good protection. Enemy mines caused significant damage to M48A3s, but crews usually survived uninjured. The M48's armor also stood up well against RPG and recoilless rifle rounds. The M48 was not impervious to these rounds, but could usually withstand several hits.

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Figure 21. M48A3 Mired in Soft Terrain

Source: Green and Sarson, 18.

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Figure 22. M48A3 Medium Battle Tank.

Source: Green and Sarson, 33.

The major shortcoming of the M48A3 was its lack of mobility in many areas, especially during the wet season. The 52-ton weight of the M48A3 hampered cross country mobility and restricted the M48A3 to roads in many coastal and delta areas. The extra weight also prevented the M48A3 from crossing poorly constructed bridges. Many bridges required reinforcement by Army engineers before M48A3s could traverse them. The M48A3 did have one mobility advantage: the added weight and power of the M48A3 made it more effective at cutting through heavily forested areas than the lighter ACAVs. The tanks often cut trails for the ACAVs. Despite its jungle busting capability, the inability of the M48A3 to travel in many areas prevented the M48A3 from being the decisive vehicle for the cavalry.

Another advantage of the M48A3 over the ACAV was its night fighting capability. The M48A3 was equipped with a Xeon searchlight over the main gun and an infrared gunner's sight. The Xeon searchlight could be used in white light or infrared (IR)

light mode. Unfortunately, this night fighting advantage was marginalized by the enemy and terrain in Vietnam. Crews seldom used the search light because it required the tank engine to run at night giving away their position to the enemy. Also, the limited fields of fire and observation in Vietnam reduced effectiveness of the IR light and sight. As a result, crews preferred to use starlight scopes from the commander's position to search for the enemy at night. Despite its limitations, the night fighting capability of the M48A3 was an asset available to crew members if they needed it.

As with most vehicles in Vietnam, crews modified their M48A3s to increase their lethality, protection, and mobility for use in Vietnam. Crews removed the commander's .50-caliber machinegun from the cupola and mounted it on a tripod welded to the top of the cupola. This prevented frequent jamming of the machine gun when mounted in the cupola and simplified the reloading procedure. An M60 machinegun was sometimes mounted on the back of the turret for firing rearward.²³ In the 11th Armored Cavalry Regiment tank companies, standard operating procedures dictated that the gunner was relocated from the gunner's seat and the extra crewman rode on the back deck with an M60. The short engagement ranges eliminated the need for precision gunnery which negated the need for a crewman in the gunner's seat. The commander was able to effectively engage close targets with the main gun from his position in the turret.

To enhance protection from RPGs, crews added field expedient add-on armor to the outside of the turret. They used sand bags, ration boxes, ammo cans, pierced steel planking, and track blocks in an attempt to detonate the RPG warhead before it hit the tank's armor.

To increase mobility, some cavalry tanks added a cutting bar across the front of the tank. A dozer blade welded from fender to fender was effective in clearing brush and small trees.²⁴ Creative and inventive cavalry troopers were always looking for ways to improve their chances of survival and mission accomplishment.

In 1969, the armored cavalry fielded a new type of combat vehicle, the M551 Sheridan. The Sheridan was the Army's solution for replacing light tanks, which were phased out in 1959. Although the ACAV and M48A3 were fairly consistent in their performance and well-liked by their crews, the M551 Sheridan was not. The M551 Sheridan was the most controversial armored fighting vehicle used by the cavalry in Vietnam. Some troopers who fought with the M551 Sheridan have nothing but praise for the vehicle, while others have nothing but contempt for it. The cavalymen of the Vietnam War had a love-hate relationship with the Sheridan (figure 23). The causes for the Sheridan controversy were numerous.



Figure 23. Sheridan M551 and Crew Members of the 3d Squadron, 4th Cavalry

Source: Starry, 42.

The controversy with the M551 Sheridan started because many people were confused about what type of vehicle it was. The Army developed the Sheridan as an Armored Reconnaissance and Airborne Assault Vehicle (AR/AAV). The infantry intended to use the Sheridan with the airborne infantry as an antitank and infantry support weapon. The Sheridan could also function as an armored reconnaissance vehicle. The Sheridan was not designed nor intended to be a direct replacement for the light or medium tank. If you search through contemporary literature forty-five years after the M551 was first built, you will still find documents referring to it as a light tank.

The lack of a suitable replacement for the cavalry's light tanks of the 1940s and 1950s led to the cavalry receiving the Sheridan. The armored cavalry phased out its last light tank, the M41 Walker Bulldog, in 1959. With no light tank replacement, the M48 main battle tanks replaced the M41 light tank in cavalry scout platoons and cavalry tank companies. The M41 was popular with cavalry troopers and many wanted to see the return of a light tank for the cavalry. The Sheridan, which looked like a light tank, appeared to be acceptable replacement for the M41.

Many cavalymen were skeptical about the Sheridan's capabilities and felt the Sheridan was forced upon them by senior officers attempting to justify the cost of the Sheridan program. As early as 1966, the Army staff in Washington placed pressure on US Army, Vietnam to accept the Sheridan.²⁵ Despite a recommendation by the Fort Knox Armor and Engineer Board against deploying the Sheridan, in late 1968 General Abrams approved the fielding of Sheridans for testing in Vietnam.²⁶ In January 1969, 1st Squadron, 11th Armored Cavalry Regiment and 3d Squadron, 4th Cavalry each received

twenty-seven Sheridans. The pressure placed on the cavalry to field the M551 intensified the cavalry's lack of confidence in it.

The capabilities of the Sheridan fell short of the ACAV and M48A3 in many areas. To meet the requirements of the infantry for an air droppable, amphibious vehicle, the Sheridan had to be light; too light to be considered a light tank. The Sheridan's combat loaded weight was almost 20,000 pounds lighter than cavalry's previous light tank, the M41A3. The hull of the Sheridan was made from aluminum to keep the Sheridan's combat weight at only sixteen tons. The Sheridan's design compromised protection for weight, making it extremely vulnerable to mines in Vietnam. Although its aluminum hull armor was similar to the M113, the enclosed hull and turret of the Sheridan ensured the blast was fully absorbed in the crew compartment; the open hull of the M113 allowed the blast to dissipate without the crew absorbing the full effect. Although the risk of serious injury was only slightly greater in a Sheridan than in an ACAV, the psychological impact on crews was enormous. This was especially true in the divisional cavalry squadrons where tankers traded in M48A3s for Sheridans. Mines that would not even penetrate the hull of an M48A3 were deadly when detonating against a Sheridan.

Survivability in the Sheridan was further diminished by the combustible-case ammunition used in the Sheridan. Typical tank rounds of the Vietnam era used a metallic shell to encase the highly flammable explosive propellant. The shell casing ejected from the breech after the round was fired. The Sheridan main gun rounds used a new and controversial combustible-case. The case combusted inside the breech, leaving no empty shell casing inside the turret. Spalling²⁷ from a ruptured hull or turret could easily ignite

the combustible-case ammunition causing deadly secondary explosions inside the turret. Crews were immensely fearful of secondary explosions caused by the ammunition, and were quick to abandon their Sheridan when it was hit by an RPG or mine.

An ominous beginning for the Sheridan added to the unfavorable attitude troopers had for the new Airborne Assault Vehicle. The very first mine strike against a Sheridan caused a catastrophic kill. The *Monthly Report - Evaluation of the M551 Sheridan* recorded the result of the first crew fatality caused by a twenty to twenty-five pound pressure detonated mine.

At 151640 Feb 69, C-35 3/4 Cav struck a mine. . . . The detonation caused a rupture, 24 inches long and 4 inches wide, at the weld joining the lower hull to the upper hull. This rupture produced ignition of stored main gun ammunition almost instantaneously.²⁸

The secondary explosions resulted in one soldier killed and four wounded.²⁹ The *Evaluation of the M551 Sheridan* concluded that the same mine hitting an ACAV would not have caused any serious injuries. This first mine strike permanently labeled the Sheridan as a “death chariot” by some crewmembers.³⁰

In reality, the Sheridan was not fully worthy of its reputation as a “death chariot.” During the same month of the first mine strike, 3rd Squadron, 4th Cavalry had three more mine strikes that caused no serious injuries. Between 1st Squadron, 11th Armored Cavalry Regiment and 3rd Squadron, 4th Cavalry, a total of ten mine strikes occurred throughout the evaluation period. The first mine strike by 3rd Squadron, 4th Cavalry resulted in the only fatality. The fifty-four Sheridans participated in 520 missions and traveled 39,455 miles during the evaluation. Sixty-four enemy contacts resulted in five troopers killed in action (table 2). The testing led to the addition of belly armor similar to the M113’s and an FMC gun shield for the commander. These modifications and crew

modifications similar to those on the M48A3 and ACAV gave the Sheridan's crews a protection level comparable to the ACAV. Although the Sheridan deserved some criticism, it was definitely not the death trap some troopers claimed it to be.

Table 2. M551 Losses and Casualties During Field Testing

Unit	Vehicles				Personnel Casualties			
	Combat Loss		Damaged		RPG		Mine	
	RPG	MINE	RPG	MINE	KIA	WIA	KIA	WIA
3/4 CAV	4	4	3	6	4	8	1	10
11th ACR	1	0	3	0	0	7	0	0
Total	5	4	6	6	4	15	1	10

Casualties By Crew Position						
	RPG			MINE		
	WIA	KIA	TOTAL	WIA	KIA	TOTAL
DRIVER	1	1	2	1	1	2
LOADER	5	1	6	3	0	3
GUNNER	4	0	4	2	0	2
COMMANDER	5	2	7	4	0	4

Notes: 1 driver was KIA by AK-47 after dismounting during RPG attack.
9 WIA in 3/4 Cav were minor and returned to duty within 3 days.
5 WIA in 11 ACR were minor and returned to duty within 3 days.

Source: Army Concept Team in Vietnam, *Sheridan-Final Report* (San Francisco, CA: Department of the Army, 1969).

A deficiency for which the Sheridan fully deserved criticism was its turret-related maintenance failures. Technical problems plagued the Sheridan. First, the combustible-case ammunition caused several problems beyond the secondary explosions. The vibration and jarring of the Sheridan in rough terrain caused the ammunition cases to crack, allowing flammable propellant to spill out. The shock wave of a nonpenetrating mine strike could damage every round in the turret. The rounds were also prone to

damage from moisture, oil, and other contaminants.³¹ Damaged rounds were difficult to load and occasionally did not fully combust, leaving a dangerous burning residue in the breach. Second, the electrical power of the turret frequently failed. The *Sheridan Evaluation* recorded a total of 125 turret power failures during testing.³² Failure was the result of the continuous operation of the turret and was exacerbated by poor environmental conditions. Turret power was used eighteen to twenty hours per day and excessive moisture and rain was prevalent in Vietnam. The third major problem was the failure of the recoil system. Leaky recoil seals resulted in the failure of the gun to function properly. Col Leach, 11th ACR Commander, stated the recoil failures were the probably the biggest problem with the Sheridan.³³ The lack of available spare parts and trained mechanics increased the amount of maintenance down time. The turret maintenance failures of the Sheridan added to the trooper's dislike of the Sheridan. When a trooper pulled the trigger, he expected a round to go down range. Anything less was not acceptable.

Despite its shortcomings the Sheridan held some advantages over the ACAV and M48A3. When it worked, the Sheridan's 152mm main gun gave it more firepower than the ACAV and the M48A3. The 152-millimeter main gun fired a devastating beehive round that contained 10,000 flechettes. During early testing of the Sheridan, 3d Squadron, 4th Squadron discovered how effective the main gun was.

On 11 March, A Troop, 3/4 Cavalry was occupying [a night defensive position] with all-around security. . . . At 2345 hours, a Sheridan crew, using the XM44 periscope made another sighting 150 meters forward of the perimeter, and defensive fires were executed. The engagement continued sporadically for the next three hours before the enemy broke contact. A sweep of the contact area at first light produced 38 NVA bodies and 3 POWs.³⁴

The 1st Squadron, 11th Armored Cavalry Regiment had similar experiences using the 152-millimeter canister round. Cavalry troopers were impressed with the firepower of the Sheridan compared with that of the ACAV. In addition to the main gun, the Sheridan had a coaxially mounted 7.62-millimeter machine gun and a .50-caliber machine gun for the commander. The Sheridan also was better equipped for night fighting than the ACAV. The Sheridan mounted a search light with both infrared and white light capability. The infrared searchlight and gunner's XM44 passive night sight enabled the Sheridan to see targets out to 1000 meters at night. Without the searchlight, the XM44 could identify targets out to 500 meters. The searchlight and sight gave cavalry platoons an enhanced capability to acquire and engage targets at night. The overwhelming firepower and the night fighting capability of the Sheridan helped restore confidence in the vehicle.

Perhaps the greatest asset of the Sheridan was its mobility. The Sheridan's mobility was better than the M48A3 and equal to the ACAV. The ground pressure of the Sheridan was actually lower than the ground pressure of the ACAV. The Sheridan could negotiate rice paddies and cross streams considered untrafficable for the M48A3. With a combat weight of just sixteen tons, the Sheridan could also travel over bridges that were too weak to carry the weight of M48A3. The Sheridan was also more fuel efficient than the M48A3, giving the Sheridan a distinct advantage in operating range. Crews were happy with the Sheridan's rugged track and suspension system. Even in the harshest terrain, throwing track in the Sheridan was almost impossible.³⁵ The one drawback with the Sheridan's mobility was its inability to make paths in the jungle like the M48A3. Cavalry troops often led with the M48A3 to create paths in the thick jungle. The lack of jungle-busting ability was mitigated, in part, by firing canister rounds to tear through the

jungle. The Sheridan offered the mobility of an armored personnel carrier with the firepower of a medium tank.

Following a trial period in early 1969, the US Army, Vietnam concluded the Sheridan's advantage in firepower, mobility, and night fighting outweighed its shortcomings and requested additional Sheridans. The Sheridan possessed greater firepower, mobility, radius of operation, and versatility than the M48. It was equal to the ACAV in mobility, but had superior firepower and better night-fighting capability than the ACAV. The Sheridan's biggest faults were its limited protection and its many turret maintenance failures. By late 1970, nearly every armored cavalry squadron in Vietnam possessed Sheridans.³⁶

In addition to the direct fire maneuver vehicles, ground cavalry squadrons also employed indirect fire assets that were assigned to the squadron. The indirect fire assets of the cavalry squadron fell under two types, mortars and self-propelled artillery. Both were critical in providing quick and responsive indirect fire for troops in contact.

The cavalry squadrons in Vietnam used 81-millimeter and 4.2-inch (107-millimeter) mortars. The mortars were mounted on a modified M113 chassis. The 81-millimeter was mounted on a M113 variant known as the M125 mortar carrier. The 4.2-inch mortar was mounted on the M106 (see figure 24) mortar carrier. The M106 and M125 mortar carriers were similar to the M113 in terms of mobility and protection. Crews fired the mortars from inside the vehicle or dismounted the mortar and fired outside of the vehicle. Both vehicles had a .50-caliber machine gun with a gun shield for security.

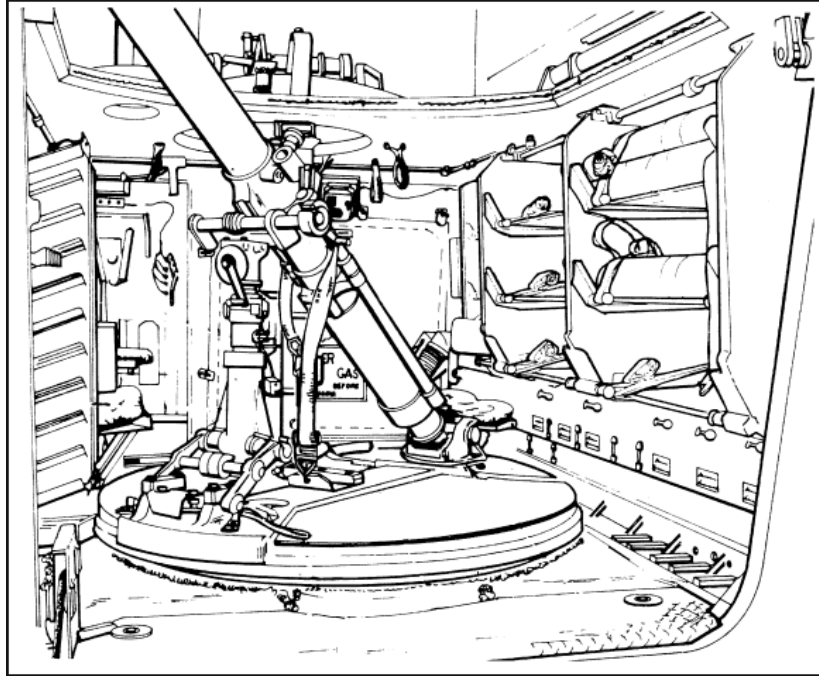


Figure 24. 4.2-Inch Mortar Mounted in a M106

Source: Department of the Army, Field Manual 23-90, *Mortars* (Washington, DC: Department of the Army, 2000), 54.

The only significant difference between the two vehicles was in the capability of the 81-millimeter and 4.2-inch mortar systems. Despite its smaller size, the 81-millimeter actually had an advantage over the 4.2-inch mortar. The minimum range and the restricted traversing capability of the 4.2-inch resulted in its replacement with the 81-millimeter mortar in Vietnam. The 4.2-inch mortar had a minimum range of 770 meters.³⁷ This minimum range was not short enough for the warfare in Vietnam. On the nonlinear battlefield of Vietnam, mortars were often positioned directly behind maneuver elements for security reasons. Defensive perimeters were also relatively small in Vietnam, especially night laager positions. The 4.2-inch mortar's minimum range of 770 meters prevented the M106 from providing indirect fire support for units too close to its

position. The 81-millimeter mortar's minimum range was only eighty-three meters, allowing it to engage targets closer to its position. The inability of the M106 to traverse 360-degrees was also a problem. The M106 4.2-inch mortar fired over the back deck of the vehicle and could only traverse 1200-mils (70-degrees). To fire in other directions required the crew to move the vehicle or dismount the mortar delaying their response. Unlike the M106, the M125's 81-millimeter mortar could traverse a full 360-degrees, allowing it to fire in any direction without moving the vehicle. The 81-millimeter mortar's ability to fire at close ranges in any direction made it a better choice for cavalry units in Vietnam.

The regimental cavalry squadrons also had a battery of self-propelled field artillery assigned to the squadron. The cavalry artillery batteries used the M109 Self-Propelled Howitzer (figure 25 and figure 26). The M109 mounted a 155-millimeter howitzer capable of firing high explosive rounds out to 14,700 meters, in addition to smoke, white phosphorous, illumination, and canister rounds. The turret had a full traverse of 360-degrees. The M109 was the standard direct-support artillery weapon employed by the Army for armor and mechanized forces the duration of the Vietnam War.

The experience of cavalry squadrons in Vietnam revealed the need for a different capability from their armored vehicles. First, the lighter, more mobile vehicles used in peacetime could not stand up to the test of combat. Vehicles such as the Jeep and M114 were not suited for combat in an armored cavalry squadron. Second, armored vehicles needed to provide firepower and protection in all directions, because the enemy in Vietnam could strike from any direction and was more likely to engage from the flanks

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Figure 25. M109 Self-Propelled Howitzer

Source: Green and Sarason, 39.

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Figure 26. M109 Self-Propelled Howitzer with RPG Screen Deployed

Source: Green and Sarason, 71

and rear. To counter this threat, the Army and crews improved the flank protection and firepower of their vehicles for a nonlinear battlefield. Third, the random mining techniques of the enemy dictated that every vehicle have sufficient belly armor, not just medium tanks. Again, the Army and crews modified combat vehicles to match this threat. Finally, successful combat vehicles in Vietnam required a balance of protection, firepower, and mobility. Vehicles that sacrificed too much protection for mobility were death traps. A vehicle that was impenetrable with overwhelming firepower was useless unless it was able to pursue the enemy through difficult terrain. After some modification, the M113, Sheridan, and M48A3, gave cavalymen adequate protection against an asymmetric threat, firepower to overwhelm the enemy at close ranges, and enough mobility to pursue the enemy over difficult terrain.

¹Donald H. Rumsfeld, response to a question from a US soldier at Camp Buehring, Kuwait, in reference to armored plating for vehicles, 9 December 2004.

²The quarter-ton truck's common name was the jeep.

³William P. Boyle, "M-114 the Scout's New Vehicle," *Armor* 72, no. 6 (November 1963): 43-46.

⁴Christopher F. Foss, *Janes's World Armoured Fighting Vehicles* (New York, NY: St. Martins Press, 1976), 183.

⁵*Ibid.*

⁶Donn A. Starry, *Armored Combat in Vietnam* (United States: Arno Press, 1980), 38.

⁷Simon Dunstan, *Vietnam Tracks: Armor in Battle, 1945-1975* (Novato, CA: Presidio Press, 1982), 43.

⁸*Ibid.*, 43.

⁹Starry, 38.

¹⁰*Jane's World Armoured Fighting Vehicles*, 183.

¹¹Army Concept Team in Vietnam, *Armor Organization for Counterinsurgency Operations in Vietnam* (Washington, DC: Department of the Army, 1966), 16.

¹²In order to swim, the driver had to put up the trim vain and turn on the bilge pumps.

¹³*Armor Organization for Counterinsurgency Operations in Vietnam*, 16.

¹⁴Dunstan, 48.

¹⁵Starry, 42.

¹⁶Starry, 73.

¹⁷The M48A3 tanks located in the 11th Armored Cavalry Regiment Troops were replaced on a two to three basis with ACAVs. The tank companies retained their M48A3 tanks. Combat Operations Research Group, *Evaluation of U.S. Army Mechanized and Armor Combat Operations in Vietnam*, vol.1: *Basic Report* (Washington, DC: Department of the Army, 1967).

¹⁸John H. Hay, *Vietnam Studies: Tactical and Material Innovations* (Washington, DC: Department of the Army, 1989), 111.

¹⁹*Evaluation of Armor Operations*, 172.

²⁰Dunstan, 107.

²¹*Ibid.*

²²*Evaluation of Armor Operations*, vol. 1, I-49.

²³Dunstan, 111.

²⁴*Ibid.*

²⁵Starry, 143.

²⁶Burton S. Boudinot, "A Sheridan Memoir: The Early Days," *Armor* (January-February 1997), 14-15.

²⁷Spalling is the metal fragments which are sprayed inside the turret when a blast or penetrating round ruptures the hull or turret.

²⁸Army Concept Team in Vietnam, "Monthly Report: Evaluation of the M551 Sheridan" (San Francisco, CA: Department of the Army, 1969), A-1.

²⁹An extra crewmember was riding on top of the Sheridan. *Ibid.*

³⁰Boudinot, 14.

³¹R. P. Hunnicutt, *Sheridan A History of the Light Tank*, vol. 2 (Novato, CA: Presidio Press, 1995), 107.

³²Army Concept Team in Vietnam, *Sheridan-Final Report* (San Francisco, CA: Department of the Army, 1969), II-10.

³³James H. Leach, "Senior Officer Debriefing Report: COL James H. Leach, CO, 11th Armored Cavalry Regiment, Period 6 April 1969 to 7 December 1969" (Washington, DC: Department of the Army, 1979),

³⁴*Sheridan-Final Report*, II-5.

³⁵*Ibid.*

³⁶Starry, 144.

³⁷Department of the Army, FM 23-90, *Mortars* (Washington, DC: Department of the Army, 2000), Table 6-2.

CHAPTER 4

CAVALRY ORGANIZATION

The unique structure of the armored cavalry squadron distinguished the armored cavalry from other combat arms organizations in the US Army. Unlike tank or infantry battalions, the armored cavalry had a permanent combined arms organization down to the platoon level. The result was a more flexible and versatile organization,. Furthermore, the armored cavalry squadrons combined arms organization allowed it to operate independently without reinforcements.

The organizational structure, personnel, and equipment of Army organizations were established by documents known as Tables of Organization and Equipment (TO&E). Typically, the Army altered the TO&E of specific units to enhance that unit's ability to perform specific tasks in a specific geographic environment. An Army approved modification to a TO&E, became known as a Modified Table of Organization and Equipment (MTOE).

An MTOE was specific to a single numbered unit such as 3d Squadron, 4th Cavalry or 1st Squadron, 4th Cavalry. Therefore, it was possible for two like units, such as two divisional armored cavalry squadrons, to have different MTOEs. During the Vietnam War, the MTOE of cavalry squadrons in Vietnam was different than cavalry squadrons in Europe or the US All armored cavalry squadrons selected for service in Vietnam were modified prior to deploying. Some modifications were made to enhance the capability of units, but some modifications reflected limitations such as troop ceilings and the availability of equipment.

Not all modifications to the cavalry TO&Es were approved by the US Army. Units routinely modified their internal organization and equipment without approval to meet their unique operating requirements and techniques. The official process for approving a TO&E was slow and commanders in Vietnam were not inclined to wait for approval. While these unofficial modifications enhanced unit capabilities, the unauthorized modifications made it difficult for the US Army and MACV to resource and provide support for nonstandard units.

The Army initiated two studies during the Vietnam War to determine to recommend standardized MTOEs for armored units in Vietnam. The initial study, the *Evaluation of Armor Operations*, was completed in March 1967. *Evaluation of Armor Operations* recommendations became the basis for standardized regimental and divisional cavalry squadron MTOEs for units in Vietnam. The MTOEs were based on the "G" series TO&E with some modifications. In 1969, the Army initiated another study, the *Optimum Mix of Armored Vehicles for Use in Stability Operations*, to re-evaluate the organization and effectiveness of armored units operating in Vietnam. Changes in the enemy and friendly situation subsequent to the *Evaluation of Armor Operations* necessitated a second study of armor units. The second report was published in March 1971. Neither report made any significant changes to the organization of cavalry units, but both reports validated changes already in place and adjusted the official MTOE documents to reflect reality.

Although the organization and equipment for cavalry squadrons developed continuously, the evolution of MTOEs can be broken down into four periods or modifications. The first set of modifications was completed prior to deployment in 1965.

The most noteworthy modification was the substitution of M114s with M113s or ACAVs and the removal of M48A3 tanks from the Regimental Cavalry platoons. The second period was the completion of the *Evaluation of Armor* report in 1967. The *Evaluation of Armor* MTOE did not significantly alter the organization and equipment of armored cavalry squadrons, but it did authorize the ACAV “A” kit and sufficient personnel required to man ACAVs. It also authorized the replacement of the M106 mortar carriers with the M125. The third modification occurred in 1969 with the fielding of Sheridans. Sheridans replaced M48A3 tanks in divisional cavalry platoons on a one for one basis and replaced two ACAVs with three Sheridans in each regimental cavalry platoon. The final period was in 1971 when the *Optimum Mix of Armored Vehicles for use in Stability Operations* was published. The report validated the current cavalry organization as effective and approved authorization changes to ancillary equipment such as radios and night vision equipment.

The smallest maneuver organization within the cavalry squadron was the armored cavalry platoon. In 1965, the armored cavalry platoon consisted of a headquarters, a scout section, a tank section, a rifle squad, and a support squad (figure 27). The armored cavalry platoon TO&E authorized one jeep, four M114s, three M48A3s, one M113, and one M106 Mortar Carrier. No other organization in the Army combined reconnaissance, armor, infantry, and indirect fire assets at the platoon level.

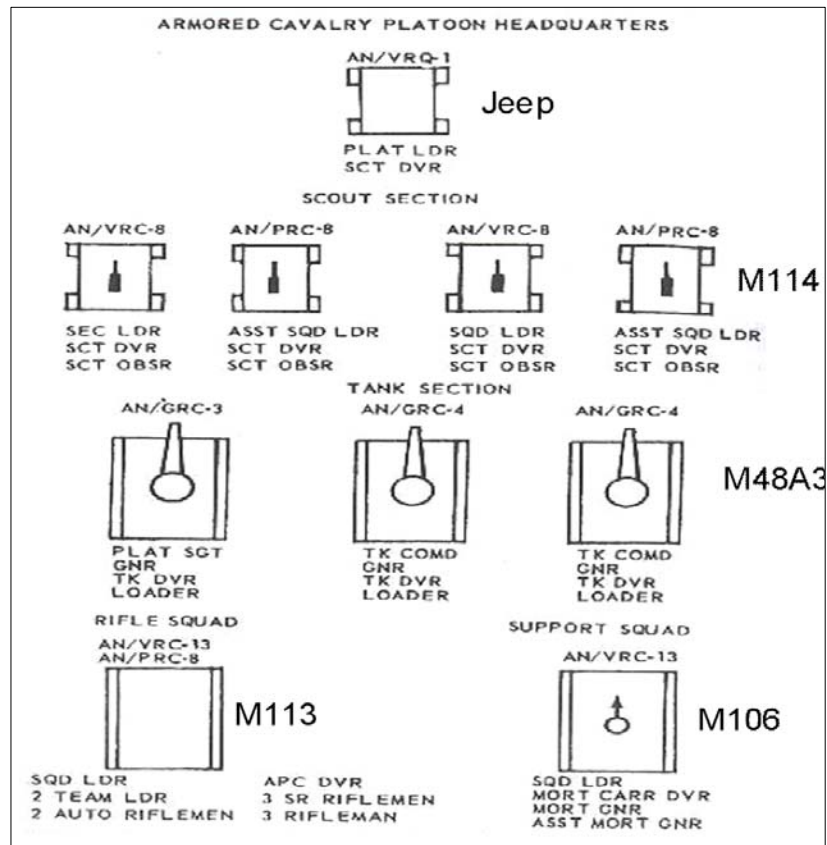


Figure 27. Armored Cavalry Platoon 1965 Prior to the Vietnam War
Source: Department of the Army, Field Manual 35-1 *Cavalry Platoon, Troop, and Squadron* (Washington, DC: Department of the Army, 1960), 50.

All armored cavalry platoons alerted to serve in Vietnam replaced the headquarters' jeep and the scout sections' M114s with M113s or ACAVs.¹ The divisional cavalry squadron platoons retained a tank section with three M48A3 tanks (figure 28); however, the regimental cavalry platoons replaced their three M48A3 tanks with two ACAVs. The new regimental armored cavalry platoon consisted of seven ACAVs, one M113 with rifle squad, and one M106 mortar carrier (figure 29).

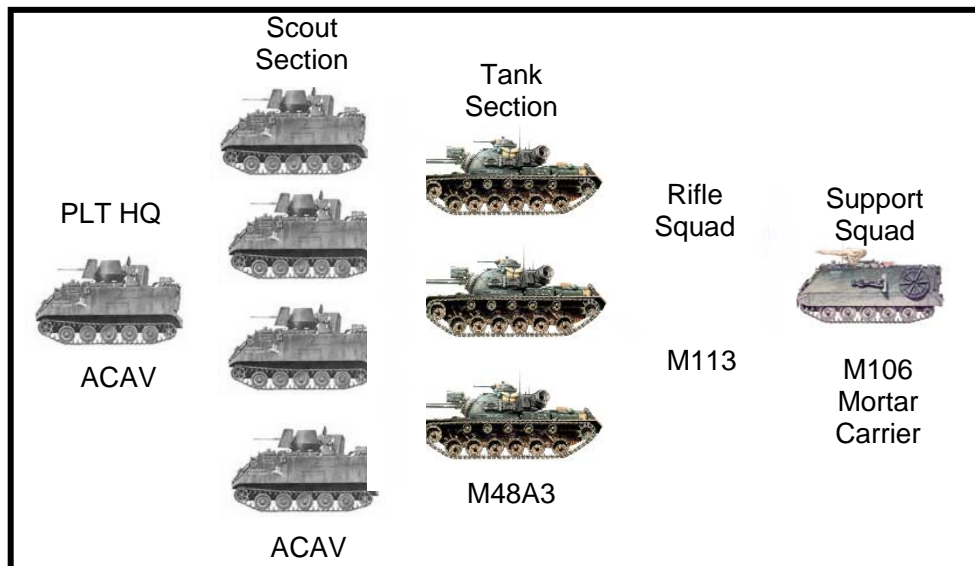


Figure 28. Modified Armored Cavalry Platoon, Division Cavalry Squadron

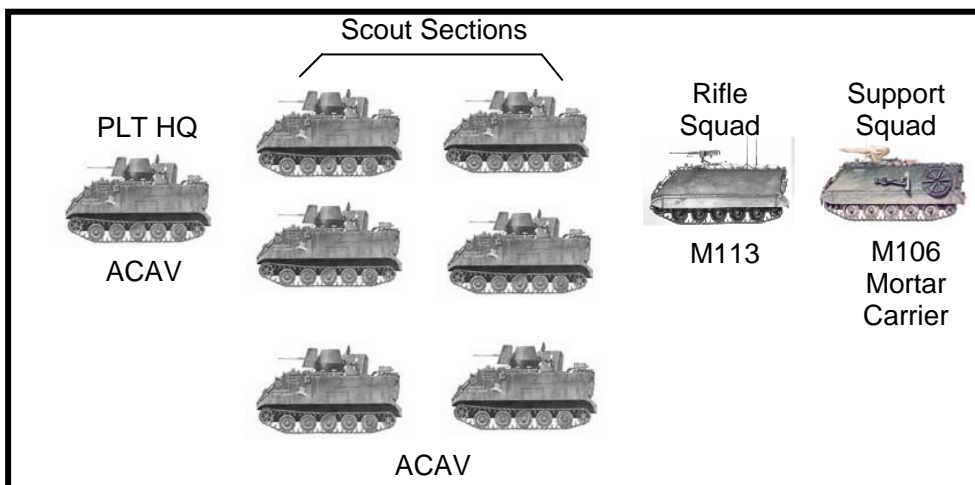


Figure 29. Modified Armored Cavalry Platoon, 11th Armored Cavalry Regiment

The decision to remove tanks from the regimental armored cavalry platoons was not made to improve capability, but a compromise struck with MACV to allow the 11th Armored Cavalry Regiment to deploy. In 1965, a “no tanks in the jungle attitude” still

existed in Vietnam and the MACV resisted the deployment of the 11th Armored Cavalry Regiment with M48A3 medium tanks. The MACV requested the 11th Armored Cavalry Regiment field M41 light tanks in lieu of the M48 medium tanks in tank companies and replace the cavalry platoon's medium tanks with M113s. If no solution was reached, the MACV was prepared to deploy a mechanized infantry brigade in place of the 11th Armored Cavalry Regiment. Lieutenant Colonel George S. Patton, the Department of the Army action officer assigned to study the issue and who later commanded the 11th Armored Cavalry Regiment, felt if he failed to reach a compromise neither the 11th Armored Cavalry Regiment nor any other large armored unit would be deployed.² The 11th Armored Cavalry Regiment consented to a compromise of retaining M48 tanks in the tanks companies and replacing the M48s with ACAVs in the cavalry platoons.

The two different cavalry platoon organizations had advantages and disadvantages. The divisional armored cavalry platoons, who kept tanks, maintained an advantage of firepower and protection when the tanks were able to maneuver with the platoon. Tank support was particularly important when conducting route security or escort missions. Tanks were at the lead and rear of columns in order to counter the NVA tactic of attacking the lead vehicle with a mine and attacking the rear vehicle with an RPG. As stated previously, tanks were also used to lead ACAVs through the jungle. The disadvantage of keeping tanks came when terrain did not permit the tanks to maneuver with the platoon. In terrain unsuitable for tanks, the divisional cavalry platoons were left with only five ACAVs compared to the seven ACAVs of the regimental cavalry platoons. The lack of tanks in the regimental cavalry platoons was mitigated by the tank companies of the regimental cavalry squadron. Regimental cavalry squadrons reinforced cavalry

troops with tanks when necessary. Divisional cavalry squadrons, lacking a tank company, did not have this option.

The next significant change to the armored cavalry platoon TO&E was the introduction of the Sheridan. The 3d Squadron, 4th Cavalry and 1st Squadron, 11th Armored Cavalry Regiment fielded the Sheridan in January 1969. The Sheridan replaced the M48A3 tanks in 3d Squadron on a one for one basis and replaced 1st Squadrons' ACAVs on a three for two basis. After the squadrons completed field testing in March 1969, the MACV authorized the fielding of Sheridans in all armored cavalry platoons. Following the addition of Sheridans, the MTOE for divisional and regimental armored cavalry platoons were identical (figure 30).

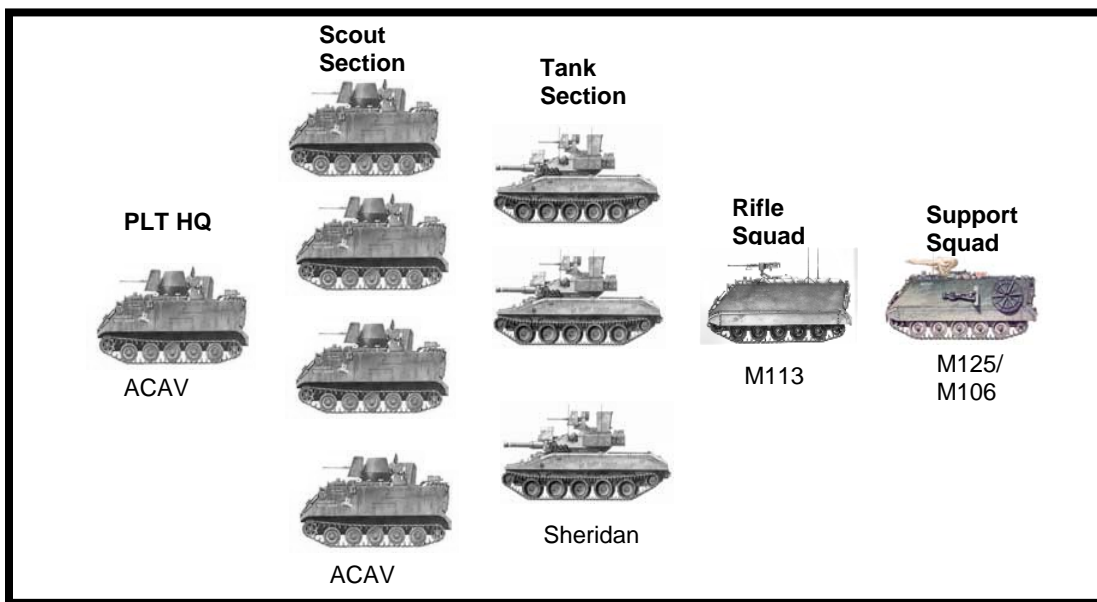


Figure 30. Armored Cavalry Platoon with Sheridan

The addition of Sheridans was a major improvement for the 11th Armored Cavalry Regiment, but had positive and negative consequences in the divisional cavalry

squadrons. For every cavalry platoon in the 11th Armored Cavalry Regiment, the MTOE added an additional combat vehicle and added the firepower of a tank without sacrificing mobility. The effect of replacing the M48A3 with the Sheridan was mixed for the divisional cavalry squadrons. The decision to replace the M48A3 was very unpopular with the troops. The change from M48A3s to Sheridans meant a significant loss in protection for the platoon. The heavy armor of the M48A3 offered much better protection for crews from mines and RPGs than the Sheridan did. The loss in protection was slightly offset by the Sheridan's small advantage in firepower; the Sheridan's 152-millimeter cannon was slightly better than the M48A3's 90-millimeter cannon. The main advantage was in a significant improvement of mobility. Unlike the M48A3, the Sheridan could travel anywhere the ACAV could go. Platoons were no longer required to leave their armor assets at their base camp when terrain couldn't support the weight of a tank. The overall consensus of the leadership was that the Sheridan was an improvement, but crews anguished over the loss of protection provided by the M48A3.

One of the most interesting aspects of the cavalry platoon organization was the integration of rifle squads at the platoon level. Each cavalry platoon was authorized an eleven man infantry squad. The squad gave the cavalry platoon the capability to execute tasks such as tunnel and bunker clearing, conducting ambush patrols at night, and establish additional listening posts and observation posts.

The standard operating procedure for the application of the infantry squad varied from unit to unit. In most instances, the personnel from the infantry squad were used to fill personnel shortages in the scout sections. The personnel shortages resulted from the substitution of ACAVs for M114s. The M114 required a crew of three, but the ACAV

required a crew of five. Initially, no additional troops were authorized to fill the new positions, therefore soldiers from the infantry squad were assigned to scout section ACAVs. The cavalry squadron MTOE was eventually modified to authorize additional scouts, but platoons were rarely at full strength because of injuries and losses. As a result, infantry squads were continuously used as a source for additional personnel. In some instances the infantry squad maintained their identity even when riding on other tracks; the squad dismounted and assembled when required. In general, the divisional squadrons kept their infantry squads intact more often than the regimental squadrons.

Another uncommon aspect of the cavalry platoon organization was the support squad with a 4.2-inch mortar assigned to the platoon. The SOP for the use of mortars at the platoon level varied from unit to unit. The minimum range of the M106 often prevented the support squad from providing indirect fire support at the platoon level in Vietnam. The area warfare environment compelled the mortar squad to operate within close proximity of the platoon because the mortar crew was unable to adequately maintain security and provide indirect fires. To maintain security and provide fires, the M106s were often consolidated at the troop or squadron level. When not consolidated, cavalry platoons sometimes employed the M106 as a direct fire maneuver vehicle, using the M106's .50- cal instead of indirect fire from the mortar. Following the recommendation of the *Evaluation of Armor*, the M125 mortar carrier was authorized in lieu of the M106 in 1967. The shorter range and 360-degree firing capability of the M125 enabled cavalry platoons to provide security for the mortar squad while using their indirect fire capability.

Even after the substitution of the M106 was authorized, not all squadrons replaced the 4.2-inch mortars. Squadron commanders differed in opinion as to how mortars were most effectively employed.³ Maintaining consolidated mortar sections and platoons facilitated clearance of fires, made ammunition re-supply easier, and enabled the massing of indirect fires. An additional advantage of consolidating mortars at the squadron level was the ability to integrate mortar fires with the artillery fires. The primary disadvantage of consolidated mortar sections and platoons was the inability to provide mortar coverage to all maneuver platoons because they were often dispersed over large areas. Some commanders preferred the M125 over the M106, but equipment shortages prevented them from acquiring the M125.

The next level in the cavalry hierarchy was the armored cavalry troop, the principle maneuver element of the armored cavalry. By TO&E, the armored cavalry troop of the division cavalry squadron and the regimental cavalry squadron were nearly identical in organization.⁴ Each cavalry troop consisted of three cavalry platoons and a headquarters platoon (figure 31). The headquarters platoon varied slightly between regimental and division troops. The regimental cavalry troop headquarters platoon consisted of a headquarters section, a maintenance section, a ground surveillance radar (GSR) section, and an admin, mess, and supply section. The divisional cavalry troop did not have an assigned GSR or mess section; these sections were held at the squadron level. With the exception of an ACAV in the headquarters section, used by the commander for command and control purposes, and some utility M113s such as the GSR section, the headquarters of a cavalry troop possessed no combat power. All dedicated combat power was in the cavalry platoons.

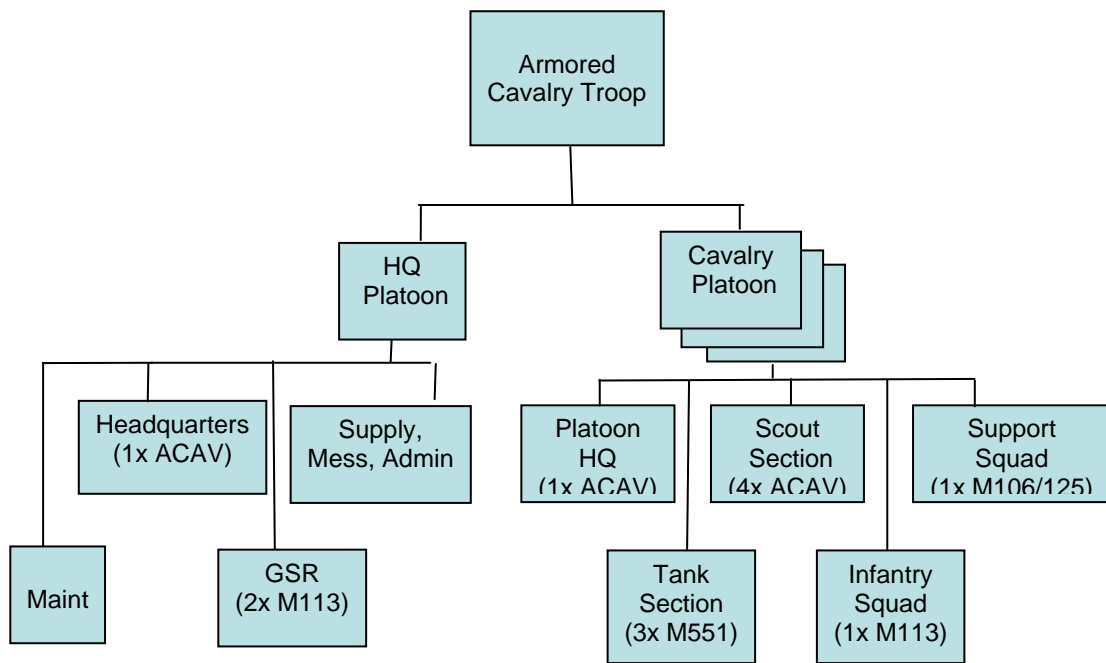


Figure 31. Armored Cavalry Troop (Reflects Organization Following the Fielding of the Sheridan Assault Vehicle)

The largest disparity in cavalry organizations came at the squadron level. In 1965 two types of armored cavalry squadrons TO&Es existed: divisional and regimental (figures 32 and 33). A total of six divisional armored cavalry squadrons and three regimental cavalry squadrons deployed to Vietnam. The divisional cavalry squadrons TO&E authorized a headquarters and headquarters troop (HHT), three armored cavalry troops, and an air cavalry troop. The regimental cavalry squadrons were authorized a HHT, three armored cavalry troops, a tank company, and an artillery battery

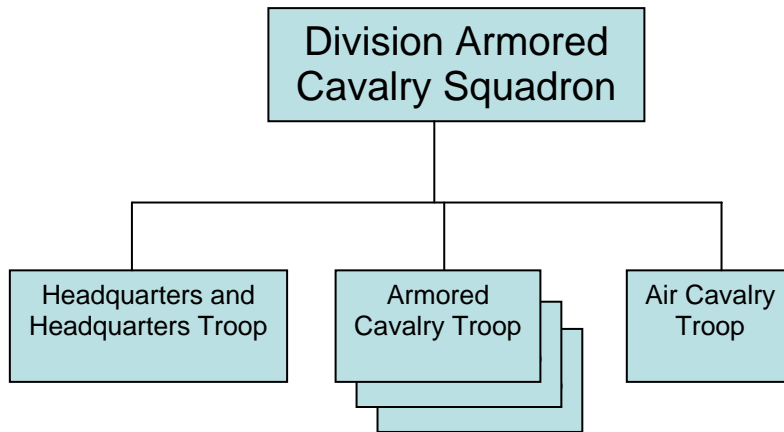


Figure 32. Divisional Armored Cavalry Squadron

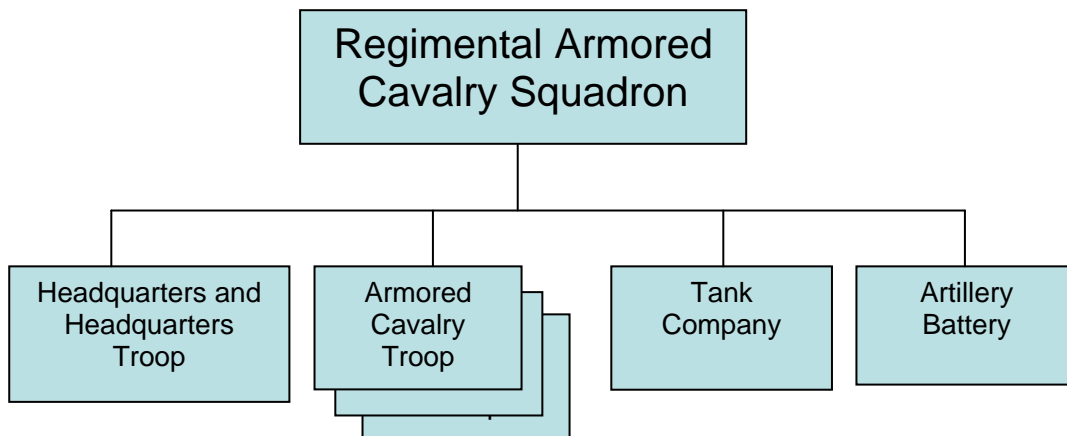


Figure 33. Armored Cavalry Squadron Organization

Both organizations had an HHT which primarily conducted command and control and combat service support (figures 34 and 35). The only combat power authorized by MTOE in the HHT was a mechanized flamethrower section. Each squadron was authorized three M132A1 mechanized flamethrowers. The flamethrowers were controlled by squadron and attached to troops on a mission basis. Typical missions for this section

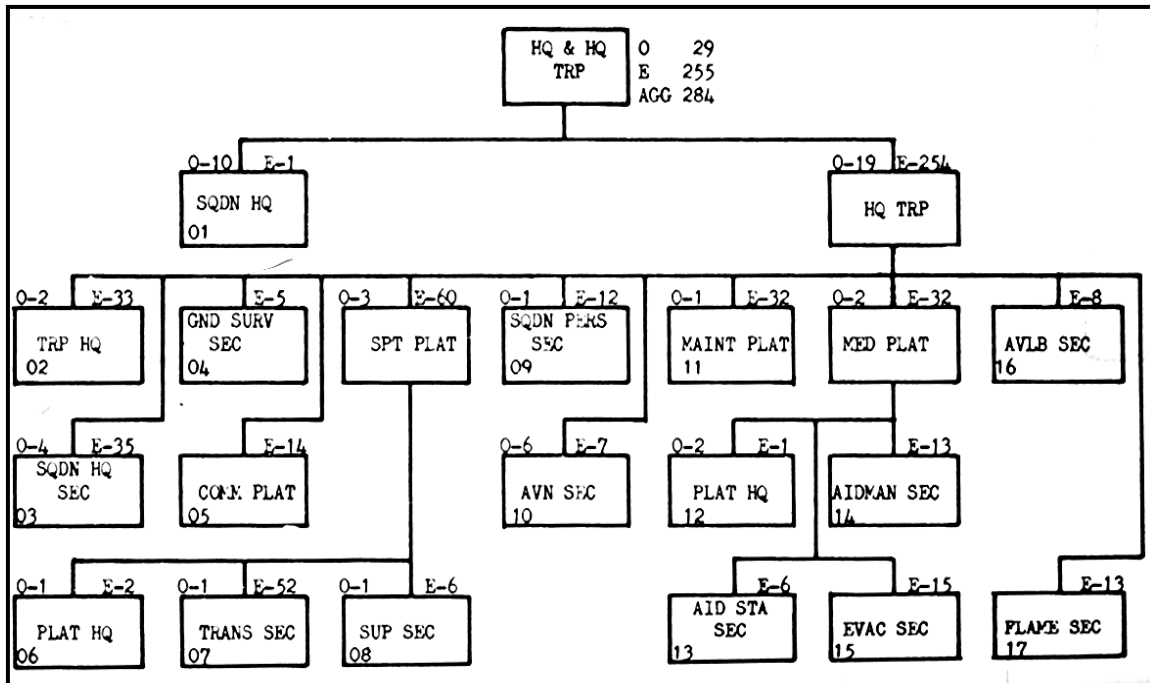


Figure 34. Regimental Cavalry Squadron HHT

Source: *Evaluation of Armor Operations*, vol 1: *Basic Report*, I-C-34.

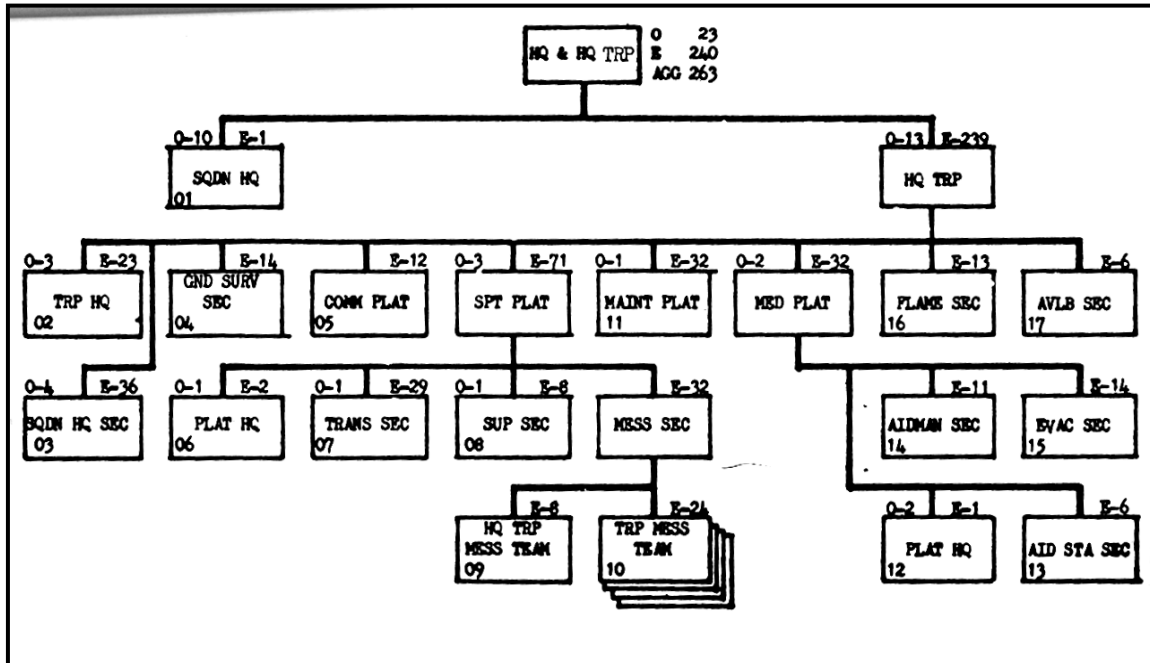


Figure 35. Division Cavalry Squadron HHT

Source: *Evaluation of Armor Operations*, vol 1: *Basic Report*, I-C-23.

included clearing brush and jungle, burning brush to improve fields of fire, and neutralizing bunkers.⁵ Some squadrons also formed provisional combat sections or platoons using ACAVs and M113s assigned to combat support and combat service support sections such as the ground surveillance section and the headquarters command section. These extra maneuver elements were used to perform economy of force security missions or as an extra maneuver element directly under squadron control.

The air cavalry troop assigned to the divisional cavalry squadron was one of the significant TO&E differences between regimental and divisional squadrons. However, divisional cavalry squadrons rarely retained control of their air cavalry troops. With few exceptions, air troops were either detached from the squadron and attached to the parent division's aviation unit or placed under the operational control of the division. When used with the ground troops, the air troop significantly enhanced the reconnaissance ability of the squadron. The air troop could also provide fire support for ground troops in contact. The loss of the air cavalry troop severely degraded the capability of the divisional armored cavalry squadron. Regimental squadrons were authorized only four aircraft used mostly for command and control and some limited reconnaissance. The majority of aviation assets in the armored cavalry regiment were assigned to the air cavalry troop controlled by the regimental headquarters.

Another significant difference between the two types of squadrons was the tank company of the regimental cavalry squadron. The tank company consisted of seventeen M48A3 tanks organized into a headquarters and three tank platoons (figure 36). The limitations of the tank company prevented it from being a decisive element for the cavalry squadron. Unlike the cavalry troops, the tank company was not able to operate

independently without reinforcement or support. Without the ability to dismount troops, the tank company could not clear terrain and had a difficult time securing itself. The limited mobility of the M48A3 also restricted the tank company's role. The main purpose of the tank company was to reinforce troops with medium tanks. Although the tank company itself lacked versatility, the ability to reinforce troops with medium tanks added versatility to the squadrons. The tank company also increased the squadron's versatility by adding a fourth maneuver element to the squadron. The tank company could be used as a dedicated reaction force, as a security force for the squadron base camp, or was assigned a separate area of operations if the squadron was assigned a large area.

The final difference between regimental and division cavalry squadron was the organic artillery battery of the regimental cavalry squadron (figure 37). The regimental cavalry squadron was authorized an artillery battery equipped with six M109 self-propelled howitzers to provide indirect fire support to the squadron. Ninety-five percent of all missions fired by the batteries were in support of their squadron.⁶ The artillery battery normally collocated with the squadron headquarters, but displaced when necessary to support mission requirements such as artillery raids. If required, the battery could operate temporarily from two locations.

For fire support, division cavalry squadrons required the support of division or corps general support artillery or direct support artillery of units the squadron was attached to. Artillery liaison teams, attached from divisional or corps general support artillery, established the squadrons' fire support coordination cell which coordinated

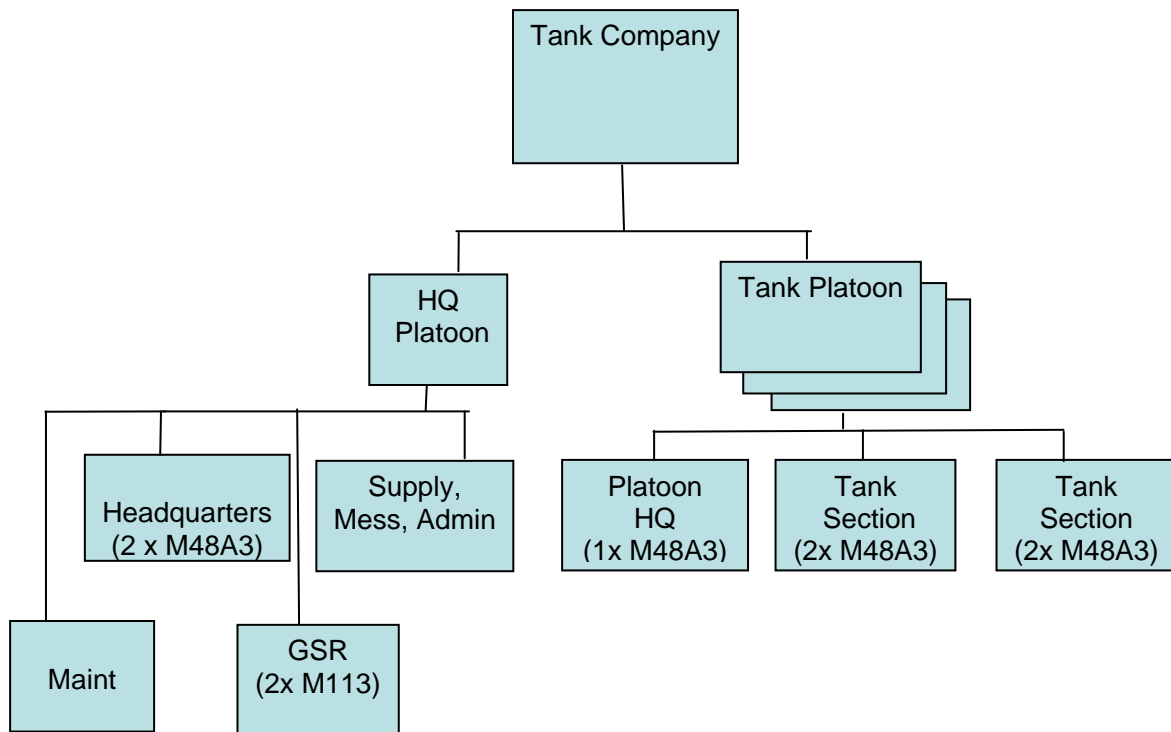


Figure 36. Tank Company, Armored Cavalry Regiment

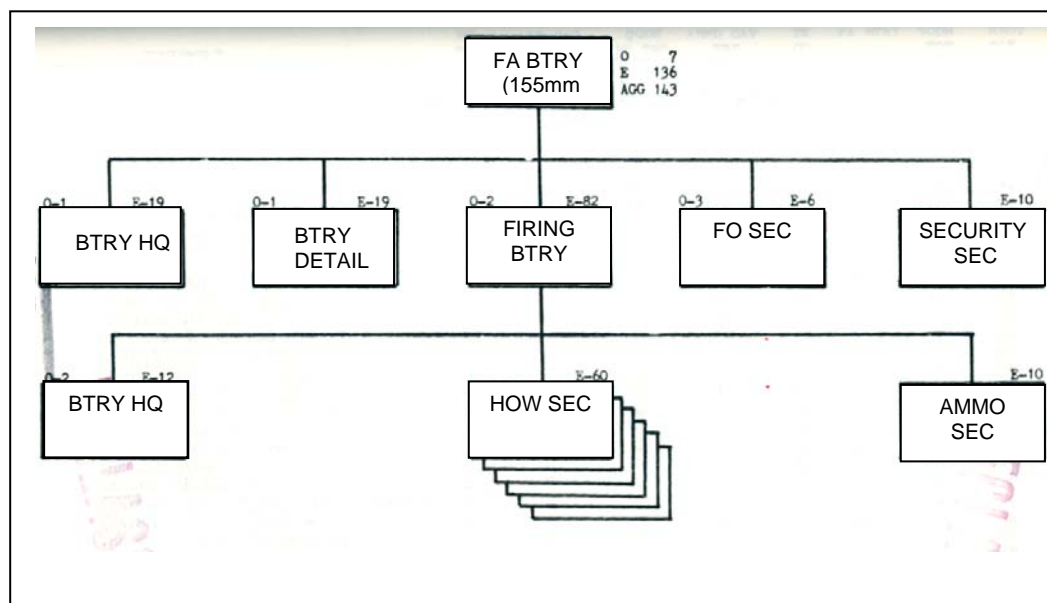


Figure 37. Artillery Battery Organization Chart

Source: *Evaluation of U.S. Army Mechanized and Armor Combat Operations in Vietnam*, vol. 1: *Basic Report*, I-C-37.

organic and nonorganic fire support in the squadron's AO. Although there were no indications that divisional units failed to receive adequate artillery support, an organic artillery battery certainly gave the regimental cavalry squadrons more responsive fires than external artillery. The artillery battery was critical for the 11th Armored Cavalry Regiment's *pile on* tactic which required the ability the quickly mass combat power.

The additional tank company and artillery battery came with a price of additional manpower and logistics. The extra firepower of the artillery battery and tank company consisting of six M109 self-propelled howitzers and seventeen tanks came with a cost of nearly 279 personnel. The authorized MTOE personnel strength of a divisional cavalry squadron minus the air cavalry troop which was usually detached was 836.⁷ The authorized MTOE strength of the regimental cavalry squadron was 1115.⁸ Most of the 279 additional soldiers performed combat service support tasks and were not combat arms or combat support. The additional assets also placed a heavy burden on the logistic system. Tank companies and artillery batteries habitually need more resupply resulting from large ammunition and fuel expenditure than any other units. With the troop ceilings in place and the difficulty of executing logistics in a nonlinear environment, it can be argued that the twenty three additional weapon systems were not worth the cost in manpower and logistics. When the Army considered adding a light tank company to 1st Squadron and 2d Squadron, 1st Cavalry before they deployed to Vietnam, the *Evaluation of Armor Operations* actually recommended against it. The report concluded the additional tanks were not worth the added manpower and logistics burden, and that the firepower of the cavalry troops was sufficient. The *Evaluation of Armor Operations* also

considered adding an artillery battery to divisional cavalry squadrons, but recommended against it.

In an environment with unconstrained resources, the regimental cavalry squadron with Sheridans at the platoon level was clearly more effective than the division cavalry squadron. Following the Sheridan fielding, the firepower, protection, and mobility of 11th Armored Cavalry Regiment's ground troops were equal to a divisional cavalry squadrons ground troop. The medium tanks of the regimental cavalry squadron tank company provided additional shock effect and a fourth maneuver element for greater flexibility at the squadron level. The organic artillery battery provided even more firepower and enabled the squadron to operate independently without external fire support.

¹The first two cavalry squadrons deployed without "A" kits and used M113s. Eventually all scout section M113s were fitted with FMC "A" kits to convert them to ACAVs.

²Donn A. Starry, *Armored Combat in Vietnam* (United States: Arno Press, 1980), 72-73.

³Army Concept Team in Vietnam, *Optimum Mix of Armored Vehicles for use in Stability Operations*, vol. 2 (San Francisco, CA: Department of the Army, 1971), G-29.

⁴U.S. Department of the Army, Field Manual 17-35, *Cavalry Platoon, Troop, Squadron* (Washington, DC: Department of the Army, 1960), 88.

⁵*Optimum Mix of Armored Vehicles for use in Stability Operations*, G-19.

⁶*Ibid.*

⁷Combat Operations Research Group, *Evaluation of U.S. Army Mechanized and Armor Combat Operations in Vietnam*, vol. 1, *Basic Report* (Washington, DC: Department of the Army, 1967), I-30.

⁸*Ibid.*

CHAPTER 5

CONCLUSION

Although the Vietnam War was thought of as an infantryman's war, it is clear that armored cavalry squadrons contributed and were successful in Vietnam. Initially, the biggest obstacle for the use of armored forces was the bias of senior leaders and staff in Vietnam. The success of the initial divisional armored cavalry squadrons deployed to Vietnam helped change the bias toward armor and opened the door for the deployment of more armored forces.

The modifications made to the cavalry squadrons TOE made them an effective fighting force in Vietnam. The most effective of the modified organizations was the armored regimental cavalry squadron MTOE following the fielding of Sheridans in 1969. The Regimental Cavalry Squadron with Sheridans provided commanders with the best combination of mobility, firepower, shock effect, and flexibility. This organization was quite capable of executing nontraditional cavalry missions it was assigned in Vietnam.

The roles and mission of cavalry squadrons in Vietnam were different than the doctrinal missions cavalry squadrons trained for during the Cold War. Cavalry squadrons were typically employed as a maneuver battalion executing search and destroy operations. The combined arms team of the cavalry was skillful at gaining contact and then massing combat power to destroy the enemy. Cavalry squadrons were also assigned to rear area security. The area warfare in Vietnam required cavalry squadrons to secure base camps and lines of communications. Although rear area security missions were not always the best use of cavalry assets, the missions were necessary and essential.

The first key to the success of the armored cavalry was the selection of the right armored vehicles. The decision to replace the M114 with the M113 was instrumental. When converted to the ACAV, the M113 provided cavalry platoons with a good balance of armor, firepower, and mobility. With additional field expedient armor and bolt-on kits, the ACAV provided crews with adequate protection from small arms fire, hand-held anti-armor weapons, and randomly placed mines. The multiple machine guns mounted on the ACAV gave it good firepower and enabled the crew to acquire and engage targets simultaneously in all directions. The most important aspect of the ACAV was its maneuverability. There were very few areas in Vietnam where the ACAV could not go. The cavalry would not have been as successful if they had kept the M114 as the primary cavalry armored vehicle.

Although controversial, the Sheridan was an important addition to the armored cavalry platoon. The Sheridan's 152mm main gun added shock effect to the regimental cavalry platoon and was a more effective anti-personnel weapon than the M48A3's 90-millimeter gun. Unlike the M48A3, the Sheridan could go anywhere the ACAV could go. The Sheridan added the firepower of a tank to the cavalry platoon, but without sacrificing mobility. The addition of the Sheridan meant the cavalry squadron would no longer leave the weapon with the largest firepower in the base camp when terrain prevented the movement of tanks.

Despite its excellent firepower and mobility, the Sheridan was still unpopular with many cavalry troopers. Its bad reputation was due in part to false expectations of its armor protection. The Sheridan was not designed to be a direct replacement for the medium tanks used by the armored cavalry. The cavalry's medium tank, the M48A3,

provided considerably better protection because it weighed nearly thirty-five tons more than the Sheridan. Thus, there is no way the Sheridan could take an RPG round or mine strike as well as the M48A3. An unfortunate incident during the initial fielding of Sheridans also maligned its reputation. The first mine strike against a Sheridan resulted in a catastrophic loss. The Sheridan was labeled a death trap, even though it provided a level of protection similar to the ACAV, regarded as adequate by crewmembers. There was one area where criticism of the Sheridan was justified – reliability. The turret of the Sheridan was prone to malfunctions. The advanced technology in the Sheridan resulted in many maintenance failures. The harsh climate, continuous operation of vehicles, and lack of repair parts exasperated the maintenance problem of the Sheridan. Despite its problems, the benefits of the Sheridans undoubtedly outweighed the negative. Adding the Sheridan was the right decision.

Another key to the Regimental Cavalry Squadron's effectiveness was its combined arms task organization. Troops and platoons were organized with infantry, armor, scouts, and mortars. The squadron also had a medium tank company and a self-propelled artillery battery. This regimental cavalry squadron combined arms organization provided sufficient firepower, mobility, and shock effect to gain and maintain contact, and then pile on combat power to defeat the enemy.

Attempting to determine what is the best organization and equipment for the army's armored cavalry squadrons will continue to be a challenge. Each geographic and political situation presents different problems. The US Army must determine what provides the best balance of protection, mobility, firepower, and flexibility. Understanding the organization and equipment of cavalry squadrons and how these

characteristics effected cavalry operations in the Vietnam War can assist us with developing the right TOE for today's cavalry squadrons. Several important lessons for use in the contemporary operating environment can be taken from the experience of armored cavalry squadrons in Vietnam.

First, if the equipment of a cavalry squadron does not match the mission, terrain, and enemy, the army must be willing to modify it. The decision to drop the M114 and replace it with the ACAV was vital for the success of the cavalry squadrons. The cavalry squadrons in Vietnam benefited greatly from the experience of the ARVN and the US advisors prior to 1965.

Second, armored vehicles must provide 360-degree protection from an asymmetric threat. In Vietnam, the largest killer of troopers was the randomly placed mine. Today, improvised explosive devices, the equivalent of randomly placed mines, are the number one killer of coalition troops in Iraq. RPGs were the second largest threat in Vietnam and remain a threat in the contemporary operating environment. The belly, side, and rear armor of combat vehicles must provide adequate protection from these threats.

Third, the role of an armored cavalry squadron in a nonlinear battlefield against an asymmetric enemy will be different than in a conventional linear battlefield. The cavalry squadrons of 3rd Infantry Division (Mechanized) and 3rd Armored Cavalry Regiment, who recently returned from duty in Operation Iraqi Freedom, were used as maneuver battalions similar to the armored cavalry squadrons in Vietnam. This is a trend which will probably continue. Armored cavalry squadrons should retain a combined arms organization with sufficient protection and firepower to both fight for information and fight like a maneuver battalion. The US Army has frequently chosen to reduce the

firepower and protection of cavalry units for greater mobility and stealth. Scouts in an armored cavalry squadron must have a platform that provides sufficient protection and firepower. The jeep and M114 were woefully inadequate for combat in Vietnam.

The cavalry troopers who fought in the Vietnam War gained useful experience that we should not forget. Although the US will not likely fight a war similar to the Vietnam War again, understanding the lessons of Vietnam in the right context will give us insight on how to build a better cavalry organization for future conflicts.

GLOSSARY

- Area of operations. A geographical area, usually defined by lateral, forward, and rear boundaries assigned to a commander, by a higher commander, in which he has responsibility and the authority to conduct military operations. (*FM 1-02*)
- Area Warfare. Style of warfare used by an armed force seeking to achieve control of the population of a country when the force was unable, or unwilling to conduct warfare in the traditional sense. Typically these forces used an asymmetric approach and nonlinear operations.
- Armor. A term normally used to refer to tanks and other armor-protected vehicles. Also refers to units or operations associated with armored vehicles.
- Armored Cavalry Assault Vehicle (ACAV). A modified version of the M113 Armored Personnel Carrier. ACAVs were modified with a gun shield for the commander's .50-caliber weapon system and two additional mounted shield-protected M60 machine guns. (*Evaluation of Armor Operations*)
- Armor Organization for Counterinsurgency*. Short title of *Armor Organization for Counterinsurgency Operations in Vietnam*. A report completed in 1966 that recommended changes to the organization of armor forces in the ARVN based primarily on the experiences of the U.S. advisors to the ARVN.
- Artillery battery. A battery is a subordinate unit of an artillery battalion. The primary weapon system found within a battery is a howitzer. A battery is the equivalent of a troop or company. (*Armor in Vietnam*)
- Asymmetric. When an enemy uses unanticipated or nontraditional approaches to circumvent or undermine an adversary's strengths while exploiting his vulnerabilities through innovative means.
- Beehive rounds. Antipersonnel projectiles fired by artillery and tank guns. Each projectile is filled with many sub-projectiles, which are shaped like a small dart. A beehive projectile usually contains a charge which can be set to explode at various ranges spraying thousands of these dart-shaped sub-projectiles. (*Armor in Vietnam*)
- Canister rounds. A canister round is similar to a beehive round, but does not contain a burster charge. Additionally, the sub-projectiles of a canister round may be small, cylindrical shaped, steel pellets instead of darts. (*Armor in Vietnam*)
- Central Office of South Vietnam. The military and political headquarters for all Viet Cong and North Vietnamese Army units in South Vietnam. (*Evaluation of Armor Operations*)

Clear and secure. The mission of a military force which is to find and capture or destroy all enemy forces within a specified area and then prevent any enemy force from entering or seriously harassing persons within the area. (*Evaluation of Armor Operations*)

Combustible cartridge case. A cartridge case made of a combustible material which is consumed in the chamber of the gun when the gun is fired. The 152mm gun of the M551 Sheridan used a combustible cartridge case.

Combat arms. Units and soldiers who close with and destroy enemy forces or provide firepower and destructive capabilities on the battlefield. The included branches and functions are: Air Defense Artillery, Armor, Cavalry, Aviation, Field Artillery, Infantry, Special Forces, and the Corps of Engineers. (*FM 1-02*)

Combat service support. The essential capabilities, functions, activities, and tasks necessary to sustain all elements of operating forces in theater at all levels of war. Within the national and theater logistic systems, it includes but is not limited to that support rendered by service forces in ensuring the aspects of supply, maintenance, transportation, health services, and other services required by aviation and ground combat troops to permit those units to accomplish their missions in combat. (*FM 1-02*)

Combined arms. The synchronized or simultaneous application of several arms, such as infantry, armor, artillery, engineers, air defense, and aviation, to achieve an effect on the enemy that is greater than if each arm was used against the enemy in sequence. (*FM 1-02*)

Combined arms team. Two or more arms mutually supporting one another, usually consisting of infantry, armor, cavalry, aviation, field artillery, air defense artillery, and engineers. (*FM 1-02*)

Corps Tactical Zone (CTZ). A major Vietnamese military and political subdivision of the Republic of Vietnam (RVN). There were four CTZs covering the entire area of South Vietnam. (*Evaluation of Armor Operations*)

Doctrine. Fundamental principles by which the military forces or elements thereof guide their actions in support of national objectives. It is authoritative but requires judgment in application. (*FM 1-02*)

Economy of force. The allocation of minimum-essential combat capability or strength to secondary efforts so that forces may be concentrated in the area where a decision is sought. (*FM 1-02*)

Evaluation of Armor Operations. Short title for the *Evaluation of Mechanized and Armor Operations in Vietnam*. A six volume report completed in 1967 which evaluated all aspects of mechanized and armor operations in Vietnam

Fire Power. The armored cavalry has mobile firepower in the form of machineguns, armor-protected mortars and howitzers, tank weapons, and individual weapons. (*FM 17-95*, 1966)

Fire Support Base (FSB). A defended perimeter within which supporting artillery and/or mortar units are emplaced to support tactical operations of maneuver units. (*Evaluation of Armor Operations*)

Flexibility. The ability of armored cavalry units to operate over wide areas and at extended distances in the accomplishment of rapidly changing missions. (*FM 35-1*)

Field Force Vietnam (FFORCEV). Headquarters which commanded CTZs in Vietnam. The I and II FFORCEV were both approximately corps in size. I FFORCEV operated in the II CTZ and the II FFORCEV operated in the III CTZ. (*Evaluation of Armor Operations*)

Herringbone Formation. A formation used by mechanized and armor units when ambushed or during halts when the unit is moving in column, normally along a road. The armored vehicles turn alternately to the sides of the road or direction of march in such a manner as to place their main armament and heaviest armor obliquely toward the flanks. The center is left clear to provide freedom of movement within the column or a haven for thin-skinned vehicles. (*Evaluation of Armor Operations*)

Laager. A temporary defensive position used by armor and mechanized troops in order to conduct resupply and maintenance operations. Normally in a circular configuration with weapon systems placed on the perimeter and command and control and support elements in the center.

Lines of communication. All the routes, land, water, and air, which connect an operating military force with its base of operations and along which supplies and military forces move. (*FM 1-02*)

Mobility. A quality or capability of military forces which permits them to move from place to place while retaining the ability to fulfill their primary mission. (*FM 1-02*)

Night vision devices. Equipment designed to increase the capability of the soldier to fight, observe, move and work at night. The term covers all equipment and systems which utilize reflected radiations. The four general categories are battlefield illumination, near infrared devices, image intensification devices and thermal imaging devices. (*Evaluation of Armor Operations*)

Nonlinear battlefield. A nonlinear battlefield is defined by its lack of structure where the close, deep, and rear operations may have no adjacent relationship.

Regiment. Brigade sized unit within the US Army Cavalry. Normally commanded by a Colonel.

Search and Destroy. The mission of a military force which is to search a specified area for enemy forces, material and installations and to capture or destroy any such force, material, or installations that may be found. (*Evaluation of Armor Operations*)

Security operations. Those operations designed to provide reaction time, maneuver space, and protection to the main body. Security operations are characterized by aggressive reconnaissance to reduce terrain and enemy unknowns, to gain and maintain contact with the enemy to ensure continuous information, and to provide early and accurate reporting of information to the protected force. Forms of security operations include screen, guard, cover, and area security. Area security operations normally are associated with rear operations. Security operations forces orient on the main body and may be oriented in any direction from a stationary or moving force. (*FM 1-02*)

Shock effect. Shock effect is achieved by combining tremendous concentrated firepower with rapid movement of tanks, mechanized vehicles, and air cavalry units. The shock effect depends on surprise achieved by speed and mobility, upon the use of weapons at effective ranges, and upon closing with the enemy. Shock effect in armored cavalry units is provided by the violent impact of the armor-protected firepower of tanks. (*FM 17-95, 1966*)

Squadron. Battalion sized unit within the US Army Cavalry. Normally commanded by a Lieutenant Colonel

Stand-to. Term used by the Army to indicate a full level of readiness within a defensive position or assembly area. Stand-to normally was normally conducted just before sunrise, which was the time of day when the enemy frequently initiated attacks.

Task Force (Battalion). A temporary grouping of unlike companies under a battalion commander, formed for a specific operation or mission. (*FM 1-02*)

Team (Company). A tactical grouping of unlike platoons under a company commander, formed for a specific operation of mission. (*FM 1-02*)

Techniques. The detailed methods used by troops or commanders in performing assigned tasks with equipment and/or personnel. (*Evaluation of Armor Operations*)

Tet offensive. A large offensive operation conducted by the NVA and VC during the Vietnamese new year celebration (Tet) in January 1968. NVA and VC forces attacked South Vietnamese cities in all four Corps Tactical Zones.

Troop. A cavalry organization which is subordinate to a Squadron and is usually commanded by a captain. A troop is the equivalent of a company.

APPENDIX A

ARMORED CAVALRY SQUADRONS WHICH FOUGHT IN THE VIETNAM WAR

Table 3 lists all the ground armored cavalry squadrons which fought in the Vietnam War, the organization to which the squadron was assigned or attached to, and the dates they were in Vietnam.

Table 3. US Armored Cavalry Squadrons of the Vietnam War

Squadron	Higher Headquarters	Dates
1st Squadron, 1st Cavalry	23rd Infantry Division	August 67 – April 72
2nd Squadron, 1st Cavalry	4th Infantry Division	August 67 – October 70
1st Squadron, 4th Cavalry	1st Infantry Division	October 65 – April 1970
3rd Squadron, 4th Cavalry	25th Infantry Division	February 66 – April 70
3rd Squadron, 5th Cavalry	9th Infantry Division	January 67 – October 70
1st Squadron, 10th Cavalry	4th Infantry Division	September 66 – November 71
1st Squadron, 11th Armored Cavalry	11th Armored Cavalry Regiment	September 66 – March 71
2nd Squadron, 11th Armored Cavalry	11th Armored Cavalry Regiment	September 66 – April 72
3rd Squadron, 11th Armored Cavalry	11th Armored Cavalry Regiment	September 66 – March 71

Source: Starry, 227-229.

APPENDIX B

CORPS TACTICAL ZONES IN VIETNAM



Figure 38. Corps Tactical Zones

Source: Rogers, xii.

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